THE CONTRIBUTION OF JOURNAL REFLECTIONS TO THE METACOGNITIVE DEVELOPMENT OF POSTGRADUATE STUDENTS AS THOUGHT LEADERS IN AN ONLINE MASTER'S PROGRAMME

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Dedication

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Abstract

Becoming a scholar means becoming a person who is continually learning and engaged with research activities. Being a scholar is strongly associated with academic work concerned with the production and evaluation of knowledge. The main difference between a scholar and a student is that a student is in the process of acquiring knowledge, whereas a scholar is a learned person with a profound knowledge actively engaging with advancing their domain discipline. Scholarliness is evident in a disposition that displays intellectual curiosity, creative thinking, critical engagement, interrogation, and an affinity for risk and foresight. A scholar is usually a person that holds a Master's degree or higher. Part of being a scholar is to develop a strong research identity within a particular discipline. This study is concerned with the development of novice and emerging scholars as thought leaders enrolled in an online Master's degree in Education in Information, Communication Technology (ICT). Of specific interest is their learning journey as captured in their online journal reflections. This study relied on a sample of 20 journal entries from five enrolled students. The unit of analysis was thus the journal entries in the form of text or images, which were believed to allow the researcher an opportunity to choose rich reflections for analysis. The data analysis process followed a thematic approach aided by the use of ATLAS.ti, qualitative data analysis software. Among the key findings of the study was that journal reflections made a noteworthy contribution to the development of postgraduate students' metacognitive skills as thought leaders. Further to this, they allowed postgraduate students the agency for carrying out introspection and to develop new learning opportunities. Key findings point to the significance of true collaboration, and opportunities for curriculum leadership and management are abundant through the use of journal reflections. University educators need to take advantage of such opportunities to inculcate metacognitive skills through such online learning activities.

Key words

Online learning, metacognition, introspection, new learning opportunities, true collaboration.

Glossary of terms

CMLE Computer Mediated Learning Experiences

ICT Information and Communication Technologies

MEd Master of Education

MKO More Knowledgeable Others

MLE Mediated Learning Experiences

MR TEQ Minimum Requirements for Teacher Education Qualifications

LMS Learning Management System

SAQA South African Qualification Authority

QDAS Qualitative Data Analysis Software

ZPD Zone of Proximal Development

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CHAPTER 1. ORIENTATION AND OVERVIEW OF THE STUDY

1.1 Introduction

The education sector is in dire need of thought leaders, especially in the area of learning with technologies. The use of Information and Communication Technologies (ICT) in the classroom remains problematic in spite of significant gains made in the past few years in the professional development of teachers. Large scale projects such as the *Gauteng Smart School* initiative and others in the education space have seen an increase in technological resources accompanied by a more robust teacher professional development approach. To make change happen, strong thought leaders are needed that are thoroughly grounded in both theory and practice.

According to the National Qualifications Framework Act (DHET, 2015), the requirements for a Master of Education (M.Ed.) graduate stipulate that coursework programmes must require a significant level of theoretical commitment and intellectual independence. Furthermore, it requires the ability to relate information to complex issues, and to display advancement or expert mastery, in a sub-field of training. Thus, successful students as emerging scholars in a Master's level programme should have the capacity to participate in research activities within their respective subject disciplines and engage in the prevailing and dominant discourse in their field of interest Tropf (2015). Further to this, Joy (2017) contends that a thoughtful pioneer is a person that is recognized as an expert in a specific field, whose ability is looked for and frequently compensated.

Leaders can have wonderful ideas, but real thought leaders have the agency to express their ideas and inspire others (ibid). Thought leaders can be viewed as experts active in professional networks to build capacity and to influence outcomes (Tropf, 2015). As such, education is the mechanism entrusted with moulding and producing students who will possess thought leadership qualities. Students enrolled for a Master of Education (M.Ed.) degree programme are usually mature and somehow experts in their various work environments. However; during their studies they are confronted with an academic world that is new to them.

Postgraduate students find themselves academically challenged and initially fail to grasp the importance and meaning of academic writing fully; having had no real prior exposure

to scholarly endeavours (Buehl, 2011). As a result, they struggle to make sense of the notion of being a thought leader or an emerging scholar in this new discipline. They also struggle with confidence given the newness of the online environment and the new content knowledge they are required to engage with on a daily basis.

Schön (1987:4), widely regarded as the father of reflection, regularly used the phrase "reflective practicum." He defined it as "a practicum aimed at helping students acquire the kind of artistry essential to competence in the indeterminate zones of practice." Bormotova (2010, p. 18) views reflection as a tool that involves giving a subject keen thought. Reflection cannot happen in the absence of metacognition. Critical reflection entails the careful deliberation of the essence of various competing ideas and assigning new meaning to these ideas as they are further refined.

Morari (2017) defined metacognition as "thinking about thinking." Reflection (traditionally known as critical thinking) and metacognition have common elements that make it difficult to separate since both address critical thinking, an aspect central towards becoming a thought leader. Rotherham and Willingham (2010) consider critical thinking as one of the skills necessary to participate fully in the world of work.

1.2 The problem

Effective student learning requires the use of processes such as planning, monitoring, application of knowledge, reflection, and regulation of that has been learnt (Azevedo, 2009). All the aforementioned aspects are included in the domain of metacognition, a term Flavel (1979) coined to describe the main factor in predicting how learning performance is predicted in the domain of problem solving (Jacobes & Harskamp, 2012). Metacognition must be made visible to advance thought leadership to yourself and to others. To self-critically engage in a visible thought process is central to being a thought leader.

Schneider and Lockl (2002) as well as Alexander, Johnson, Albano, Freygang, and Scott (2006) link metacognition to constructs such as meta-learning, motivation, and critical thinking. These aspects are all-important especially at the level of postgraduate students. Furthermore, metacognition can also be divided into declarative metacognitive, cognitive monitoring knowledge and regulation of strategies. A closer look at journal reflections, or reflective journals, in general shows that they contain instances of metacognitive

knowledge, metacognitive control strategies, and metacognitive experiences that can facilitate a clearer understanding of the metacognitive skills necessary for postgraduate students (Buwalda, Bouman, & Van Duijin, 2008). From this perspective, the metacognitive knowledge developed from the use of journal reflections refers to the knowledge about the postgraduate students' cognition. This is much like their knowledge of their cognitive control or memory performance.

The journal reflections thus allow for the documentation of experiences that involve judgments and various control strategies in the formulation of associated responses in the control of learning (Wells, 2000). It is important that postgraduate students and their higher education lecturers realise that the association amongst these three components in solving problems might be such that a postgraduate student has unrealistic expectations about his cognitive capacity (metacognitive information). This uncertainty might be the after-effect of past metacognitive encounters of the individual in engaging with troublesome issues or disappointments (metacognitive encounters), which may in the long run result in the absence of certainty to adapt to issues and how to understand them (metacognitive control strategies).

Knowledge, or metacognitive, processes that include appraising, reflecting, controlling, and monitoring of processes are often captured through journal reflections that students keep, but are not always considered for assessment and are therefore underreported (Chan, 2011). To address the mentioned academic and professional challenges students face in developing scholarliness, journal reflections were used a mechanism to aid in the scholarly journey of becoming a thought leader. Journal reflections can be seen as a systematic and disciplined meaning-making process, which is a perspective borrowed from the writings of Dewey and Schön (Lai & Calandra, 2010). As such, this research endeavour is concerned with the use of journal reflections as a possible mechanism for the development of metacognition in the process of developing thought leaders in a postgraduate qualification. In this sense, the study aims to establish the importance of journal reflections in promoting metacognitive development in postgraduate students to enhance the development of an effective problem-solving process in higher education.

1.3 Research study questions

This study was guided by the following main and sub-research questions.

1.3.1 Main research question

How do journal reflections contribute to the metacognitive development of postgraduate students as thought leaders in an online education programme?

1.3.2 Subsidiary questions

1) What role do journal reflections play in the metacognitive development of postgraduate students as thought leaders in an online education programme?
2) What contributions do journal reflections make towards the development of metacognition in postgraduate students in an online education programme?
3) How useful are the journal reflections in developing metacognition in postgraduate students as thought leaders in an online education programme?

1.4 Aim and objectives of this research study

The main aim of the study is to establish the contribution made by journal reflections to the metacognitive development of postgraduate students as thought leaders in an online ICT education module. In accordance with this aim, the following objectives were set:

1) To examine the role journal reflections play in the metacognitive development of postgraduate students as thought leaders in an online education programme.
2) To identify the many and varied contributions journal reflections make towards the development of metacognition among postgraduate students as thought leaders in an online ICT education programme.
3) To determine the usefulness of journal reflections in the development of metacognition in post graduate students as thought leaders via an online education programme.

1.5 Research design and methodology

In this section of the study, an overview of the discussion of the research philosophy, design, population and sampling, data collection, and analysis procedures is presented. The overview begins with a focus on the philosophy within which the study is situated.

1.5.1 Research design philosophy

This study will adopt an interpretivist stance given its focus on the subjective experiences of the participants (Nieuwenhuis, 2016). Adopting this stance will provide room for the researcher to construct new meaning from various participants' experiences by considering multiple perspectives of the given phenomenon (Leedy & Ormrod, 2012). A qualitative case study research design is selected as the most appropriate process to investigate the phenomenon and will allow for an in-depth analysis within a real-life context. According to Maxwell (2012), a case study research allows for flexibility in describing and analysing various forms of data. Baxter and Jack (2008) are also of the opinion that a case study design provides researchers with an opportunity to study complex phenomena within their contexts. Yin (2009) adds to this by saying that the design also allows for an exploration of a single institution or organization capable of allowing for in-depth analysis and reporting. Creswell's (2009) view that the qualitative design is a way of exploring and understanding the construction of reality and the meaning attributed to a social problem by individuals or groups was taken into account as well. From this view, it follows that the case study design is most appropriate because it allows the use of multiple sources of data collection and analysis, thereby making the results of the study reliable and trustworthy (Leedy & Ormrod, 2012).

The population for this study will consist of Master of Education Degree students specializing in Information and Communications Technology (ICT) enrolled at the University of Johannesburg. The online M.Ed. students in the ICT in Education programme are expected to reflect in their online journals regularly as they engage with content during each of the eight modules. Journal reflections of five participants will be purposefully sampled from a cohort of 78. Postgraduate students' online journal reflections constituted the focus of analysis to establish their contribution to the metacognitive development of the students in an online ICT Education programme. The reflective journals considered for the study included those captured in modules *Educational reform: ICT practices & policy development A* and *Educational reform: ICT practices & policy development B.* The criteria for purposive sampling were be based on the postgraduate students' final grades. The criteria for inclusion in the sample comprise those who achieved above 75% for the specific reflection journals included in the sample.

Purposive sampling helped the researcher to generate subjective data for the study (Hesse-Biber, 2010).

The data collection methods adopted for this study were document analysis, which comprised the students' journal reflections. Document analysis, as a method of qualitative research data collection, involved the content of documents being analysed and interpreted by the researcher to give voice and meaning to the given phenomenon under investigation (Bowen, 2009).

According to Oka and Shaw (2010), data analysis is one of the primary aspects of research process where all the collected data is analysed and inferences are made, whilst using the appropriate theoretical or conceptual frameworks derived from the relevant domain. Qualitative research analysts, such as Hesse-Biber and Leavy (2012), maintain that qualitative data analysis ought to begin while the data collection process is still in progress. Analysing documents for this study incorporated coding content into themes (Bowen, 2009). A rubric was thus used to grade or score specific documents. The process of document analysis involved a thematic approach where the identified codes were clustered into code families, or what Nieuwenhuis (2016) refers to as superordinate themes. The superordinate themes then formed the basis of the discussion of the findings as reported in the fourth chapter of this study.

1.6 Ethical considerations

Babbie and Mouton (2010, p. 469) indicate that ethics refer to "conforming to the standardized conduct of a given profession." The data collection process for this study necessitated the researcher to seek and obtain the necessary ethical clearance, specifically the permission to carry out the study, from the Faculty of Education Research Committee. To use the students' journal reflections, direct written consent had to be obtained from the five students who reflected more than five times, on a weekly basis. Creswell (2014, p.166) explains that it is important to protect the privacy and confidentiality of individuals who participate in the study. The students received an informed consent form that included an explanation of the research aim and process. This form states that certain rights are guaranteed and that when they sign the form, they are agreeing to be involved in the study and acknowledge the protection of their rights (Bertram & Christiansen, 2014). Students' names, surnames, and student numbers

appear in their reflection journals. The consent form states that their names, surnames, and student numbers will remain anonymous when the results of the study are presented. Students' individual identities were coded reflecting the number of the student and the reflection number.

1.7 Measures to ensure trustworthiness

For this study, measures to ensure trustworthiness will include triangulation and a clear audit trail. Triangulation, in social sciences research, refers to the combination of two or more theories, data sources, methods, or investigators in one study of a single phenomenon to converge on a single construct, and can be employed in both quantitative and qualitative studies (Yin, 2012). In this study, the researcher adopted data and methodological triangulations to ensure the trustworthiness of the study.

1.8 The significance of the study

The findings of this study are expected to contribute to the design of learning activities, such as journal reflections, in online and blended modes of delivery that can advance metacognitive awareness to support emerging thought leaders on their scholarly journey.

Drawing on the insights of Margery and Ginsberg (2014) that people often think of lecturing or teaching as a one-way process where educators are the only ones involved in the imparting of knowledge in learners, this study can contribute to the already existing body of literature on the importance of blended and online learning as one of the strategies for enhancing the development of metacognition among postgraduate students.

Drawing on Amory's (2012) contention that ICT mediated teaching and learning (blended learning) offers important theoretical and policy implications for classroom practitioners and students, this study can certainly contribute towards deepening the postgraduate students' understanding of how online education programmes offer them an opportunity for metacognition as a product of computer mediated learning experiences (CMLE).

Furthermore, the study also aims to contribute towards influencing university educational policies and curriculum development by highlighting some of the crucial aspects necessary for computer-mediated educational programmes in institutions of higher

learning for students to be developed holistically: physically, socially, morally, psychologically, emotionally, spiritually, or psycho-socially (Donald, et al., 2012).

1.9 Chapter organization

This section deals with a review of the organization of chapters in the study.

Chapter 1: This chapter (introduction and background) introduces the study by unpacking the research problem; background to the problem; research questions; research aims and objectives; research philosophy; research design; and measures to ensure trustworthiness.

Chapter 2: The chapter reviews literature related to the value of journal reflections in fostering the development of metacognition in postgraduate students as thought leaders in an online education programme. The literature is reviewed in light of the Vygotskian socio-cultural theoretical framework.

Chapter 3: In this chapter, the research design and approach is presented. Data collection methods are covered, including the type of sampling and analysis procedures, ethical considerations, and measures to ensure the trustworthiness of the study.

Chapter 4: The findings are presented, including the analysis and interpretation of coded data. Results are given as evidenced from the qualitative findings of the study.

Chapter 5: A summary of the major findings, recommendations, conclusion, and possible areas for further research is presented.

CHAPTER 2. LITERATURE REVIEW

2.1 Introduction

Guided by Nieuwenhuis's (2016) assertion that the more a new researcher comprehends trends in their field of training, the more the individual in question can move toward their new study from an informed position.

This chapter presents a clear description of the concept of metacognition as referred to one's knowledge concerning his or her own cognitive processes or anything related to him; for example, the learning-relevant properties of date or information (Merriam-Webster, 2012). Furthermore, metacognition as an awareness or analysis of a postgraduate student's own learning or thinking processes is examined and the fact that it includes facets such as self-regulation, which describes the student's ability to orchestrate his or her own learning, plan, monitor success, and correct errors when appropriate, all in an effort to ensure effective intentional learning.

Given that postgraduate students need to develop the ability to reflect on their learning activities, the development of metacognitive skills implies the need for them to reflect on their own performance (National Research Council, 2000). In this process the Master of Education postgraduate students need to learn to monitor and direct their own progress, by asking questions such as "What am I doing now?," "Is it getting me anywhere?," "What could I be doing instead?" This general metacognitive level helps them to avoid persevering in unproductive postgraduate learning approaches (Perkins & Salomon, 2010).

Insights are drawn from the South African Qualification Authority document Minimum Requirements for Teacher Education Qualifications followed by an examination of postgraduate students as thought leaders and a section of the discussion of their characteristics and the emerging scholarly traits of thought leaders. This is followed by an examination of the affordances of online learning environments, which is viewed in terms of how it promotes data trailing, archiving, accessibility and availability of opportunities for the post-graduate students in shared spaces. Thereafter the unique nature of reflections in the development of metacognition are considered. This is followed by an examination of the socio-cultural approach as a theoretical framework for the study

and the role of journal reflections in the development of metacognition in postgraduate students as thought leaders in an online education programme. The final section in the literature review focuses on strategies for promoting metacognitive development in postgraduate students. A detailed discussion of each of the aforementioned headings is given in the subsequent sections of this chapter.

2.2 Purpose of a Master of Education degree

Drawing some insights from the South African National Qualifications Framework Amendment Bill (SAQA NQF 2018), it is crucial to note that the purpose to improve the national qualifications framework through institutions entailed the need for them to initiate postgraduate degree programmes that prioritise building expertise and specialisation in the skills shortage fields. This view is of paramount importance in every educational institution because it helps them create learning programmes that prioritise the competence of students whilst also developing the critical skills needed in implementing responses to complex developmental challenges (Mukora, 2016; SAQA NQF, 2018). To complete a professional Master of Education degree (M.Ed.) in Information Communication Technology (ICT), a coursework programme needs to be completed. This entails the study and knowledge of theory, the exercise of intellectual independence, and application of this knowledge in problem solving in educational contexts (SAQA NQF, 2018; Young, 2015). Further to this, the coursework also requires that students exhibit a high level of innovation and professional expertise in the field of computer education (Parker &Harley, 2007). Thus, the sentiments embodied in the national qualifications framework ought to translate into successful products as postgraduate products who should demonstrate a fast maturing capacity as emerging scholars and thought leaders in their respective disciplines, and in the general ICT discipline (Moll, 2017). The issue of postgraduate students as thought leaders is explored in the following section.

2.3 Post-graduate students as thought leaders

Joy (2017) asserts that a thought leader is an individual who is recognised as an authority in a specific subject area largely because their expertise is credible and sought after. Based on this, it can be argued that, as emergent ICT experts, the Master of Education postgraduate students could develop into sought after leaders whose ideas would help in society development, cooperate problem solving, and further development of the ICT

field. It is believed that upon completion of their postgraduate qualification, the graduates will be transformed into real ICT in Education thought leaders with an agency to express ideas so as to inspire others. As thought leaders, the graduates of the M.Ed. in ICT in Education programme could be viewed as active experts in their field of digital learning because the skills they acquire in the progrmme enable them to build capacity and influence in the education sector in this much needed focus area (Tropf, 2015).

It can also be argued that as thought leaders the M.Ed. postgraduates should be among the early adopters of innovation and must be able to act as champions for other upcoming thought leaders. This, figuratively, implies that they have to further inspire leadership, ignite imaginations, explore new ways, and dispel old myths by illuminating new paths for the future so that others can follow in their footsteps (Butler, 2012). This idea is also shared by Alhaddi (2014) in his contention that new ICT, or computer studies, innovation creates opportunities for new ideas to be accepted and applied, which culminate in thought leadership practices. Further to this, the views of Hee and Ying (2019) argue that thought leadership stems from the generation of a new idea and ends with the application and implementation of the idea. It is in this light that this section of the literature review argues that postgraduate degrees, especially in ICT in Education, serve as the ideal mechanism entrusted with moulding and producing thought leaders who will ultimately possess the necessary thought leadership skills and qualities essential for social life.

2.4 Characteristics of thought leaders

Herndon and Kor-Sins (2019) are of the view that thought leadership manifests in highly learned people in a variety of ways. While some thought leaders are quiet innovators, possessing highly influential skills, others need to show and prove the virtues and advantages of their ideas. However, some thought leaders are not innovators, but adopt new technologies or new ways of doing things at an early stage and may be first to implement the newly developed ideas. The aforementioned clearly shows that thought leadership skills can range from the possession of quiet excellent innovation to highly influential skills demonstrated by the merits, demerits, and biases contained in some operating procedures in social life (Herndon & Kor-Sins, 2019). In spite of the abovementioned characteristics of thought leaders, others may share some defining attributes, which explain their ability to understand something instinctively without the need for conscious reasoning or strong intuition as further noted by Herndon and Kor-

Sins (2019). In addition to this, some thought leaders are openly creative thinkers, brainstormers, out-of-the-box thinkers, and always stay abreast of emerging trends instead of focusing on technological skills needed for their own field of work (Alhaddi, 2014). Given that technology constantly emerges and requires new knowledge and skills towards the sustainability of organisational goals, the students of the university's M.Ed. degree programmes as thought leaders need to stay ahead with ideas to keep their learning organisations afloat (Baines, Norgaard & Rossing, 2019).

In order to be successful, the future of educational institutions require experts with ICT skills as those offered in the M.Ed. programme. For Hee and Ying (2019) such postgraduate students need to have the right digital education necessary for them to empower learners in their schools, colleges, and universities. Digital transformation, as Hee and King (2019) calls the preceding process, is of paramount importance and an imperative skill that every thought leader needs to possess. The future ICT education system tends to emphasize innovation, digital technology, science, and mathematics, the M.Ed. facilitators in universities, as exemplary thought leaders in the education industry, need to play an important role in providing digital learning classrooms for their M.Ed. postgraduate students. With the advent of the Fourth Industrial Revolution (4IR), ICT education has become a big challenge in developing individuals to think technologically, creatively, and innovatively in order to develop skills necessary for a fast-changing world (Marwala, 2019).

2.5 Emerging scholarly traits

It takes year of being fully immersed in a specific discipline to develop proficient levels of expertise. Progressing from a novice level to that of an expert requires progressive problem solving and engaging with increasingly complex problems. A novice scholar's journey needs to be strategically aligned with their stage of development. Vygotsky (1987) describes the aforementioned process of scaffolding as tantamount to transforming a student or learner from knowing less to knowing more, that is, from lower to higher mental functions.

What distinguish an expert from a novice is that experts can better organise and integrate their knowledge and are also better at accessing and using it. Because of their deep knowledge of their specific domain, they organise their knowledge around core

components that guide their thinking. Being an expert thus necessitates the promotion of new ideas, continuous improvement, constant innovation and flexibility, and an ability to understand instinctively without the need for conscious reasoning, or what Herndon and Kor-Sins (2019) call strong intuition. This type of strong intuition takes years to develop and is grounded in deep theoretical understanding of the practical implications when new ideas are brought to life. Novices tend to organise their knowledge around lists of facts and formulas that can slow down their problem-solving abilities.

In the design of learning programmes, it is therefore important for students to grow their knowledge base whilst also learning how best to organise their new knowledge (Johnson, Duran, Hassebrock, Moller, Prietula, Feltovich, Swanson, 1981). A number of differences between experts and novices are listed in Table 2-1 as well as instructional recommendations provided of how to address these differences in the design of learning materials (Prensky & Robinson, 2017).

Table 2-1 Summary of expert/Novice differences and recommendations on how to address these differences in learning environments (Prensky & Robinson, 2017)

Expert/Novice Difference	Instructional Tip
Expertise is developed in stages through progressive problem solving.	Start novice learners with straightforward, ideal application exercises. Provide clear directions and opportunities for feedback. Slowly build in complexity and guide self-reflection. Provide opportunities for independent practice, and assist students in managing emotions.
Experts know more.	Build a strong foundational knowledge base. Then through solving problems, more knowledge can be gained.
Experts have meaningful patterns of information.	Help learners see the patterns, connections and structure of the material through concept maps, building comparative tables, making explicit connections to other material/course/content, or demonstrating a "think aloud" process showing how you solve problems. Case-oriented learning forces learners to develop mental representations under real time constraints.[1]
Expert knowledge is conditional.	Instructors should help students use the appropriate facts and formulas to solve problems so students know the when, where and why to use the knowledge they are learning.
Experts have superior working memory.	The more connections, experiences and structured practice an individual has, the more the information becomes "sticky" in the brain, thus increasing working memory. The focus should not be on remembering specific facts, but identifying how the information correlates with larger concepts or in different contexts.
Experts can retrieve important aspects of their knowledge with little attentional effort.	Help learners retrieve information, especially in different contexts. This can be accomplished through quizzes, "clickers," questioning techniques, brainstorming activities, etc.
Experts are more self-regulated and have different motivations.	Instructors should show the novice an explicit thought process. By making the process explicit, novices can see how and why experts select and use information. Most techniques follow this model.[32]
Experts gather less information.	Providing opportunities for discussion surrounding why one piece of information is pertinent and another is not.
Experts are fast.	Instructors should "slow down" their thought process so students can see it. In addition, assignment length should be gauged appropriately based on how much slower a learner might take to solve a problem.

All of the recommendations in the form of an instructional tip are relevant, however tow of these speak directly to the development of meta-cognition. The first is to help students see the patterns, connections and structure of material by making explicit connections to other material/course/content or demonstrating a "think aloud" process showing how you

solve problems. The second is for instructors to should show the novice an explicit thought process. By making the process explicit, novices can see how and why experts select and use information. Section 2.10 will cover metacognitive development in more detail.

2.6 Affordance of online learning environments

In this section the affordances of online learning environments are examined in terms of how they promote data trail, archiving, accessibility, availability, as well as shared spaces.

2.6.1 Data trail

Through online learning environments, every action is captured and maintained in user log files. Therefore, audit trails can be used to maintain computer security and for the use of active user records, or the recovery of previously lost transactions. In the commercial environment, Prensky (2012) suggests that access to a user's data trail helps realise some of the relevant ways to use that information to enable and ensure repeat purchases by these customers. The data and information such as items purchased, date of purchase, and purchase amounts tracked through a point of sale computer provide the expert with ideas to entice customers to return to the business for repeat purchase (Burgstahler, 2014). Through this data trail, experts can develop promotional offers that print instantly at the point of sale, thus providing the customer with information that will motivate them to buy again in the future, for example, matching shoes to go with the dress that they just bought (Prensky, 2012).

Applied to an online postgraduate course, an audit trail programme equips the postgraduate students to be able to track website searches on vital research topics (Burgstahler, 2014). In online courses it can assist facilitators to track a student's engagement and learning habits by monitoring the individual items browsed and the amount of time spent on each (Hee & Ying, 2019). Postgraduate facilitators can then use these findings to segment their students' online activities and target them with relevant information that resonates with their study programmes (Abdulmohsen, 2010).

Affording postgraduate student facilitators or lecturers an opportunity for data trail also helps them in tracking student surveys (Bialocerkowski, Johnson, Allan & Phillips, 2013). For example, traditional surveys, focus groups, and modern-day online discussion boards are still the most effective methods in creating dialogues and collecting insight directly

from postgraduate students as the target audience. Lecturers at the postgraduate level can slant their approaches based on their primary goal (Burgstahler, 2014). For example, trying to identify what motivates top achieving students, or trying to determine the best way to engage a target demographic. To achieve this, they might need to develop a set of relevant questions and contact students on their list who fit that profile (Garner, 2008). The collection of data from multiple sources gives the interested party a 360-degree view of his or her students. As a result of wanting to gain a complete picture of their students' study life, in addition to learning valuable insights, the postgraduate facilitators or lecturers might be able to use the collected data multiple times to fine-tune their students' studying trends or patterns (Kuhn & Pearsall, 2008). This would help them in keeping the lessons coming and to find out how their students study for a given course (Adey & Shayer, 2013).

2.6.2 Archiving

Postgraduate students must have a thorough knowledge about the process of archiving. The procedure and process of preserving, organising, and providing access to archived materials and information is increasingly becoming of paramount importance in ICT (Prensky, 2012). There are times when some computers are used as archives. Every ICT postgraduate student needs to be aware that virtually each and every computer has a facility for archiving, furthermore they need to know how it functions (Abdulmohsen, 2010). The postgraduate students need to be aware of the physical place of storage, often termed as an archive or a repository, which every computer ought to have and further to this it is also important to note that the computer use of term archive is not a mistake with how a term is applied in record-keeping context (Prensky, 2012). An archive is by definition the accumulation of historical information or records where they are located (Prensky, 2010).

For postgraduate students, it might also be important to enable them to realise that some of the computer archives might contain basic source documents that have been kept through a person or an organisation's existence, and are kept to show the work and activities of that person or organisation (Crowe et al., 2008). Professional archivists and computer studies students should see archives as recording folders that have been necessarily and naturally developed as a result of regular legal, administrative, commercial, or social activities (Prensky, 2010). Postgraduate facilitators may have archival data they may wish to avail to their postgraduate students. This would help clarify

the importance of archiving in computing. It is imperative for the postgraduate staff to understand the importance of affording their postgraduate students archived online learning environmental components of their teaching and learning activities (Crowe et al., 2008). By definition, an archived file constitutes one or more computer files along with metadata (Kuhn & Pearsall, 2008). Archiving files enables one to combine multiple sets of data into a single file for easier portability and storage, or to compress files to make them smaller and consume less storage space (Crowe et al, 2008).

Exposing postgraduate students to an online opportunity for web archiving is essential. Web archiving involves the collection of portions of the World Wide Web, making sure that the collection is kept in an archive, such as the archive site, for access by future users like people doing research, historians, and the general public (Crowe et al., 2008). Owing to the considerable size of the web, web archivists normally make use of web crawlers for automated collection. Postgraduate staff and their students need this insight for their teaching and learning activities. An academic computer archive may be used to store important material like the institution's administrative records, personal and professional papers of former outstanding students (alumni), lecturers, and student leaders, as well as memorabilia related to the school or university organizations (Crowe et al,. 2008).

2.7 The unique nature of reflections in the development of metacognition

The significance of using reflections and metacognition in education dates back to questioning methods used by Socrates' to Dewey's twentieth-century position that asserts people learn a lot from, or by, reflecting on their lived experiences instead of the current or actual experiences (Dewey, 1933). What is most, or more, current is the coining of the word, metacognition, and the appearance of metacognition as a research field in the previous four decades. The concept of metacognition, which is credited to developmental psychologist John Flavell, is applied in various subjects in different ways (Flavell, 2010). Below is an excerpt from the original writings of Flavell, as well as many bonus explanations and conceptualizations taken from variety sources. It proves to be more than just study skills, but has been coupled to improving thinking skills and endorsing conceptual revolution in students (Nickerson *et al.*, 2015). Furthermore, there is empirical proof that improved metacognition is linked to promoting reflections through many activities such as corrections in academic writing and repeating previously covered work

as part of the learning process (Adey & Shayer, 2013). Available evidence from, for example, Kuhn and Pearsall (2008) indicates that students who present poor metacognitive skills perform less well, academically, than their peers with excellent metacognitive abilities. However, there is lot that is yet to be discovered and understood about the impact of metacognition in learning, especially amid postgraduates and in peculiar conditions (e.g., biology vs physics vs music theory).

The use of journal reflections or reflective journals as learning tools in online learning programmes thus enables students to think like effective leaders. To use Garner's (2008) terminology, it makes them become "metacognitively" aware and ensures that they explicitly articulate how their thinking about a topic develops over time. The ability to do this is a sure sign of having developed metacognitive skills in learning. This desire could be approximated by the affirmation that ICT educators need undergraduate learning contact to help students adapt to thinking beyond the learnt levels. Promoting the development of postgraduate student metacognition, training them to consider how they think about online learning, and how they take on learning about it would be deemed a useful tactic in striving to reach these sorts of goals for postgraduate students (Crowe *et al.*, 2008).

In terms of the usefulness of reflective journals in the development of metacognition among postgraduate students, an effective metacognitive strategy is to be analytical about what did or did not work well in one's studies and to use the conclusions to these questions in preparation for future assessment. Instructors can assign tasks to students to review themselves by asking different types of questions, such as "What worked well that I should remember to do next time?" "What did not work so well that I should not do next time or that I should change?" This exercise assigned by an instructor, in line with other forms of assessment, will provide students with a strategy for developing metacognitive approaches to the different contexts of their disciplines (Adey & Shayer, 2013).

Furthermore, instructors can assign a re-read of this writing before the next examination and a second writing assignment on how well students followed their advice to themselves. Moreover, students can be tasked to have a discussion with their peers on examination preparation strategies in order to identify new examination preparation strategies that are/were used by their peers. The continual engagement in metacognitive

thinking and learning strategies through writing would enable students to create a reflective journal that provides them with some form of credit as for other module activities (Angelo & Cross, 2013).

2.8 Theoretical framework

The theoretical perspective deployed in this study is the Vygotskian socio-cultural approach to teaching and learning. This perspective is adopted as the lens for the study due to its contribution to the explication of mediated learning experiences (MLE), a process Vygotsky (1987) maintained is necessary for all learning activities. Proponents of the socio-cultural perspective, for example, De Valenzuela (2010), Wertsch (2008), Kozulin (2002), and John-Steiner and Mahn (2008) believe learning is mediated with the aid of mediators such as material, tools, semiotics, and other human beings. Students are able to decipher the content very well and for Vygotsky this is often made possible through scaffolding learning in the learners' zones of proximal development (ZPD). Scaffolding, with its origins in construction and in Bruner's theory, implies a process of taking students through the paces as their learning skills develop from a lower to a higher level (John-Steiner & Mahn, 2008). In the explanation of the socio-cultural approach to teaching and learning, facilities such as computer accessories, reflective journals, and hardware and software programs used in online programmes, as well as the language used by the learning facilitator and his or her students as teaching and learning aids constitute the material and the psychological tools necessary for mediated learning experiences (MLE) (Kozulin, 2002). The language used in all efforts to enhance student cognition serves as part of the psychological tools, especially when the online learning facilitator tries to explain the activity to students so that they fully understand what the activity entails. By explaining key concepts and exemplifying crucial aspects such as the hardware and software components (as part of Learning Management Systems) of some online programmes necessary to help students develop metacognitively, it would be proper to argue that many of the psychological tools are used simultaneously with the material tools in mediated learning experiences (Wertsch, 2008). The role of language in mediating learning as well as helping students to develop effective metacognitive skills as thought leaders is crucial (Vygotsky, 1987). This basically means instructions should be made clear regarding the activity at hand and how to go about using course tools in order to do such activities.

When language is used to mediate online learning activities and to develop metacognitive skills in the students' ZPD, then the students' skills are transformed from what Vygotsky (1987) calls lower to higher mental functions. An example of this process is when students' skills progress from using particular tools such creating threads to type or attach their journal reflections or discussions. The former is a lower function while the latter becomes a higher order cognitive function (De Valenzuela, 2010). The zone of proximal development thus represents an opportune moment when students are keen to progress to a higher mental or psychological level, such as when they wish to move to the next unit part of their learning progression.

Tudge (2010) describes the ZPD as the difference between what the students can do on their own and what they can do with the aid of an adult, teacher, or more capable peer. Lecturers play a vital role as they need to be actively involved with students in order to guide them as they reflect weekly. This is the reason for student support forums. From this view, the ZPD in students in an online learning course or programme explains a place of potential development that is between the lower and higher mental functions. It is at this stage where students should be scaffolded so that their learning is transformed to higher psychological functions, such as enabling them to develop higher metacognitive skills as thought leaders. Figure 2.1 summarises the importance of mediating online learning activities in the students' ZPD.

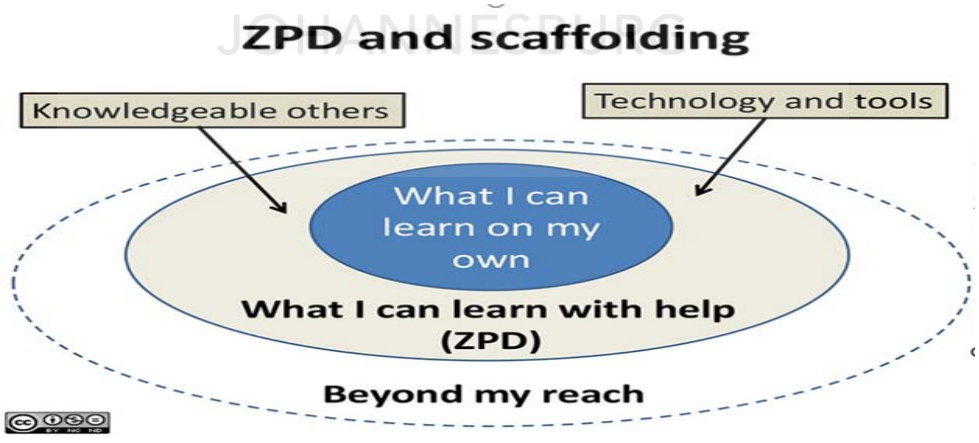

Figure 2-1 An illustration of the Zone of Proximal Development, (Source: Adapted from Donald et al., 2009: 34)

If ICT inclined practitioners present something beyond their students' grasp, they tend to lose the attention of some students, in contrast, the presentation of content that is too familiar could also result in the loss of students' attention (Donald et al., 2009). The concept of the ZPD therefore demonstrates the importance of working closely with students in the critical space of potential development (John-Steiner & Mahn, 2008). The ZPD is an important concept that emphasises two interrelated constructs: mediation and internalisation.

Vygotsky (1987) argues that "learning occurs first inter-psychologically on the social plane in a mutually cooperative interaction between the learner and the more capable other who provides appropriate mediation and then intra-psychologically on an individual plane, when the abilities originally residing in an individual's social interactions become internalised and re-emerge as new cognitive functions" (Shabani, 2016). As a result of intra-psychological development, the ZPD differentiates between what the students can achieve independently and what they are now able to self-mediate in their cognitive functioning without depending on the external environment (Shabani, 2016:3). It is in this light that it is often argued that effective mediation happens in the students' ZPD. For it to be most effective, there is need for deliberate engagement by a more competent individual, which in this context would be a lecturer (Tudge, 2010). It is for this reason that most Learning Management Systems offer a variety of tools so as to allow inclusion in terms of learning. Virtual learning such as Blackboard Collaborate can also be used to strengthen learning as it accommodates virtual learners.

The above shows that in online learning programmes the intervention process has to present a challenge for the students to come up with a new method of thinking in order to raise them to a higher level of rationalizing than before (John-Steiner & Mahn, 2008). In different words, online education and training does not have to be about practitioners or facilitators providing module content to learners, but could be about involving an intentional exertion to challenge and help them to group and understand information in a forward thinking way and other more effective ways (Vygotsky, 1987). For Vygotsky, interaction with peers, as is evident in open discussions, reflective journals, and learning

conversations, is a common and effective method of aiding students in developing metacognition (Tudge, 2010).

2.9 The role of journal reflections in metacognitive development

According to Vygotsky (1987), metacognitive growth emanates from being in a social setting, connections through directed learning within the students' ZPD and their more knowledgeable others (MKO) help them co-construct information and understanding. Vygotsky places significant importance on the role of language and the more knowledgeable other in intellectual development (Vygotsky, 1987). This view that has made him regard other human beings as important mediators in the mediated learning experiences whether virtual or on a face to face encounter. The theoretical and empirical basis that sustains the need to comprehend the language of online interactive learning and the role of journal reflections in the process all boil down to the importance of mediated learning experiences and its role in fostering metacognition in students.

Vygotsky views meanings including computer-mediated instructions and activities as social strictures which are built and delivered between students in a social setting, and each of these has a history and culture (computer culture) with its own set of connotations (Prensky, 2010). Therefore, the immediate social relations that occur in families, peer groups, schools, online classrooms, and local communities are then mirrored in online computer learning programmes culminating in the effective development of effective metacognitive skills (Wertsch, 2008; Donald et al, 2009). The educational implications of Vygotsky's theory for the development of student metacognitive skills as thought leaders through online learning activities include the view that it offers important insights into the social structure of information, which covers information and communication technological (ICT) skills and knowledge (Kozulin, 2002). Furthermore, ICT data is vibrant and not still, as it is formed, constructed and re-constructed in different social circumstances and at diverse historical times (Wertsch, 2008).

Journal reflections work as reflective facilities that offer students and their educators the opportunity to relive past experiences, to know where they are coming from and thus determine where they wish to go, which is an important milestone in all teaching and learning activities for both staff and students (Kozulin, 2002). It follows therefore that online interactive learning situations are a necessary precursor for effective learning

(Mortimer & Scott, 2003). This view is not only central to online learning activities. According to the Vygotskian perspective, development and training involve a passage from social backgrounds to individual comprehensions (Wertsch, 2008).

Vygotsky acknowledged the main role played by language in the metacognitive advance process (Vygotsky, 1987). In language he included written language and verbal, scientific or mathematical, sign language and other symbol systems, for example, symbols which signify elements in computer schemes (Donald et al, 2009). Given that the computer uses a language and that online programmes also require mastery of computer-based language, it follows that issues such as Vygotsky's significance of inner speech as a forerunner in cognitive development need to have a firm basis in student learning and development (Wertsch, 2008). Furthermore, Vygotsky recognises that the aforementioned change indicates the beginning of metacognition, which implies discerning about thinking and hence cognitive development (Donald et al., 2009). The aforementioned shows that it is overbearing to recognise the acute role played by language in the metacognitive expansion of students, whether postgraduate or undergraduates, as it has important implications for all teaching and learning activities (John-Steiner & Mahn, 2008). Although, problems raised includes the difficulty of learning through the medium of a second language as well as the necessity for computer educators to encourage reflective interactions in the classroom in the form of group work, untried work among others (Donald et al., 2009).

2.10 Strategies for metacognitive development in postgraduate students.

Wertsch (2008) notes that the chief approach to adding attention to metacognition in postgraduate students is to train them in metacognitive interventions explicitly. A more general approach is to construct classroom practice based on metacognitive tactics by modifying what is already being done through mediated learning experiences and other interventions, as described in the subsequent sections of this chapter.

2.10.1 Explicitly teaching students metacognitive strategies in computer courses

There is a requirement on training for metacognitive information explicitly given that we are frequently marvelled by the amount of students who study to higher institutions having little or challenged with information on metacognition; information on variety tactics, different cognitive duties, and particularly, relevant information about themselves (Pintrich, 2002). Training students how to use metacognition to comprehend the manner in which they think about themselves is a key step towards the path to thinking like 21st century students. In the context of postgraduate online teaching and learning, this need not consume a lot of time or energy, which is of service to the learners and for learning, including educators and training. The table below illustrates examples of self-questions that metacognitive postgraduate online students may ponder about in the course of planning, observing, and evaluating the online learning programmes (Prensky, 2010). While this assortment of questions by no means represents the complete landscape of what metacognition might involve in post graduate students, it does avail starting points for faculty who wish to address students explicitly on metacognitive strategies. The following questions can be directly made available to students, or embed them into particular activities as shown in Table 2.2.

Table 2.2: Sample self-questions to promote student metacognition about learning

ACTIVITY	PLANNING	MONITORING	EVALUATING
Class session (Online or face-to-face learning)	What are the goals of the class session going to be? • What do I already know about this topic? How could I best prepare for the class session? • Where should I sit and what should I be doing (or not doing) to best support my learning during class? • What questions do I already have about this topic that I want to find out more about?	What questions arise for me during the class session? Am I writing them down somewhere? • Do I find this interesting? Why or why not? How could I make this material personally relevant? • Can I distinguish important information from details? If not, how will I figure this out?	How did the ideas of today's class session relate to previous class sessions? • What do I actively need do to get my questions answered and my confusions clarified? • What did I find most interesting about class today?

ACTIVITY	PLANNING	MONITORING	EVALUATING
Active-learning task and/or homework assignment	What is the instructor's goal in having me do this task? • What are all the things I need to do to successfully accomplish this task? • What resources do I need to complete the task? How will I make sure I have them? • How much time do I need to complete the task? • If I have done something like this before, how could I do a better job this time?	What strategies am I using that are working well or not working well to help me learn? • What other resources could I be using to complete this task? What action should I take to get these? • What is most challenging for me about this task? What is most confusing? What could I do differently mid-assignment to address these challenges and confusions?	• To what extent did I successfully accomplish the goals of the task? • To what extent did I use the resources available to me? • If I were the instructor, what would I identify as strengths of my work and flaws in my work? • When I do an assignment or task like this again, what do I want to remember to do differently? What worked well for me that I should use next time? What do I want to remember to do differently?
Quiz or examination	What strategies will I use to study (e.g., study groups, problem sets, evaluating text figures, challenging myself with practice quizzes, and/or going to office hours and review sessions)? • How much time do I plan on studying? Over what period of time and for how long do I need to study? • Which aspects of the course material should I spend more or less time on, based on my current understanding?	• To what extent am I being systematic in studying the material for the exam? • To what extent am I taking advantage of all the learning support available to me? • Am I struggling with my motivation to study? If so, do I remember why I am taking this course? • Which of my confusions have I clarified? How was I able to get them clarified?	What about my exam preparation worked well that I should remember to do next time? • What did not work well that I should not do next time, or that I should change? • What questions did I not answer correctly? Why? How did my answer compare with the suggested correct answer? • What confusions do I have that I still need to clarify?
Overall course	Why is it important to learn the material in this course? • How does success in this course relate to	In what ways is the teaching in this course supportive of my learning? How could I maximize this?	What will I still remember five years from now that I learned in this course? • What advice would I

ACTIVITY	PLANNING	MONITORING	EVALUATING
	my career goals? • How am I going to actively monitor my learning in this course? • What do I most want to learn in this course? • What do I want to be able to do by the end of this course?	• In what ways is the teaching in this course not supportive of my learning? How could I compensate for, or change, this? • How interested am I in this course? How confident am I in my learning? What could I do to increase my interest and confidence?	give a friend about how to learn the most from this course? • If I were to teach this course, how would I change it? • What have I learned about how I learn in this course that I could use in my future computer skills courses and my career?

2.10.2 Building an online classroom culture grounded in reflection and metacognition

Pintrich (2002) observes that making the discussion of metacognitive knowledge part of the everyday discourse of the online classroom helps foster a language for postgraduate students to talk about their own cognition and learning. Using specific individual assignments and journal reflections to teach students is one approach to the more subtle ways that metacognition can be integrated into the fabric of any course and become part of the everyday language of the facilitator and students. This is particularly useful in helping students to become aware of when it is appropriate to apply their own metacognitive strategies (John-Steiner & Mahn, 2008); for example, identifying confusions in journal reflections that they may have learned from previous assignments. The point at which students have learned metacognitive strategies and have become aware of when to apply these strategies is hypothetically the point at which they have matured into lifelong learners within their disciplines (Nagano, Mostert, & van der Westhuizen, 2012).

Below are several starting points for thinking about how the language and habit of metacognition could become part of everyday classroom culture. Below are four general ways that instructors might build an online classroom culture that promotes metacognition and conveys that culture to students.

While most faculties are welcoming of reflective questions arising from the students in or outside of class, it is not common practice for postgraduate students in science courses

to pass on their misperceptions. Rather, the emphasis is on the correct answers and on being scientifically precise (Seymour and Hewitt, 2017). Just granting students permission to be chaotic is one way of providing the incentive for students to engage in metacognitive thinking and to reflect on what they do not comprehend. At times the instructor needs to reflect openly and share with students that an upcoming theme has proved perplexing to students in the past and that bewilderment is to be expected. Even slight modification in course activities could give students the opportunity to share what is confusing to them, instead of concealing it (Magano et al., 2012; Prensky, 2010). For example, during the in-class online pair discussions of a clicker question, when students compare their selected answers they will question and reflect on their choices. This leads to the discussion of any confusion points, which allows them to become metacognitively active in this process.

2.10.3 Integrating journal reflections into course work

Through making some changes to already existing module assignments, journal reflections can be integrated into the online modules. (Prensky, 2010). A few more questions can be integrated to activity problems in order to promote and ensure individual thinking. The reflection questions do not have to be complex and can be about the student's experience or challenges faced in completing the assignment. The inclusion of this type of question in the module assignment by the instructor ensures that student are metacognitively active in completing their daily module tasks (Wertsch, 2008). Comparably, through the use of diagrams and maps for online assignments, module instructors can enable students to mention their reflection on experiences and challenges faced in the work. In this more subtle approach, what changes is not the assignment itself, but the nature of the assignment. (Tropf, 2015).

2.10.4 Metacognitive modelling by the instructor for students

From a professional, practicing computer scientist's point of view, it can be extremely challenging for one to reflect on a period when one did not think scientifically. However, it is necessary to provide self-reflective examples of one's personal transitions in thinking to allow students to recall the areas of their own computerised confusions (Flavell, 2015). The research process forces researchers to think metacognitively and reflect on their current understanding of their research system, to think about important questions at

present, and how thinking has changed through time with new data (Mutekwe, 2014). An example of metacognitive modelling is when ICT specialists demonstrate to students how they procedurally solve a problem, namely the order and process that they follow and how they check the work upon completion. (Prensky, 2010).

2.10.5 Using metacognition to make the most of active learning

Changes and improvements are being implemented in postgraduate online learning to promote the use of more active-learning strategies (Tanner, 2011). Despite these changes and improvements, the different interpretations and applications of active learning in different classroom contexts have not been well documented or investigated (Ebert-May et al., 2011). The concepts of metacognition and active learning are rarely discussed in articles on postgraduate studies. In fact, the term active learning is prominent and often used at undergraduate level studies, whereas metacognition does not make an appearance (Tanner, 2011). The effectiveness of active-learning pedagogies in different contexts is influenced by the instructors' ability to consider student metacognition in the application of active-learning strategies (Tanner, 2011).

Hesse-Biber and Leavy (2010) note that during the 1980s, K–12 science, there was an increased focus on practical learning, which can be compared to the modern-day shift towards active online learning in graduate online learning. The criticism of the 1980s practical learning was that K–12 students were performing a lot of practical activities, but there was minimal metacognition. The practical era in K–12 science education led to change in the language and emphasis in policy documents to minds-on and inquiry-based learning in the following decade (National Research Council, 1996). One aspect of this shift in emphasis in K–12 science education reform was an increased emphasis on student metacognition, students thinking about what they were thinking while they were doing, as opposed to just doing hands-on, active things without thinking. In order to prevent the same challenge of what accompanied the 1980s practical learning education reform, there is need to integrate metacognition into undergraduate classrooms and assist in maintaining the emphasis on the learning part of active learning (Coutinho, 2007).

2.11 Summary

This chapter first looked at the relevant qualification specifications that inform the competencies expected of a postgraduate student on master's level and made the case for students to display thought leadership as a scholarly trait. The affordances of creating audit trails in LMSs were considered along with the use of a reflection journal as a tool to aid metacognitive development. The socio-cultural perspective as the underpinning theory for the study was considered and strategies for metacognitive development explored. The next chapter will present the research design.

CHAPTER 3. THE RESEARCH PROCESS

3.1 Introduction

The initial chapter expressed the logical flow of the study. It also highlighted the purpose of the Master of Education degree (M.Ed.), drawing from the Minimum Requirements for Teacher Education Qualifications (MRTEQ), is for graduates to become thought leaders in the discipline and display emerging scholarly traits. Furthermore, the preceding chapter briefly examined the affordances of online and blended learning environments; accessibility and availability of shared spaces; the unique role of reflections in general and journal reflections, in particular; aspects of metacognition; and tools for mediation and internalisation. This chapter presents the research design for this study.

3.2 The research processes

The research process is described in terms of the research onion (Saunders, Lewis, & Thornhill, 2012). Various layers of research decisions and processes as depicted in a schematic representation of an onion. The outer layers represent the research departure point relating to the philosophical stance of the researcher and then moves to the approach, strategy, time horizon, data collection methods, and data analysis. The individual layers of the research onion is presented in the following sections.

3.2.1 Applying the research onion

The research onion principle represents several layers of decisions that seek to guide researchers in paying attention to the practical aspects of the research process. The researcher should first consider their philosophical stance and set clear limits for the research (Sahay, 2016) instead of starting with the inner layer by making decisions about sampling and data collection. The philosophical assumptions as adopted at the outset of the research should to be clearly described to ensure the best fit of the various subsequent research components (Holden & Lynch, 2004). The diagrammatic illustration below depicts the various options for consideration within each layer of the research onion.

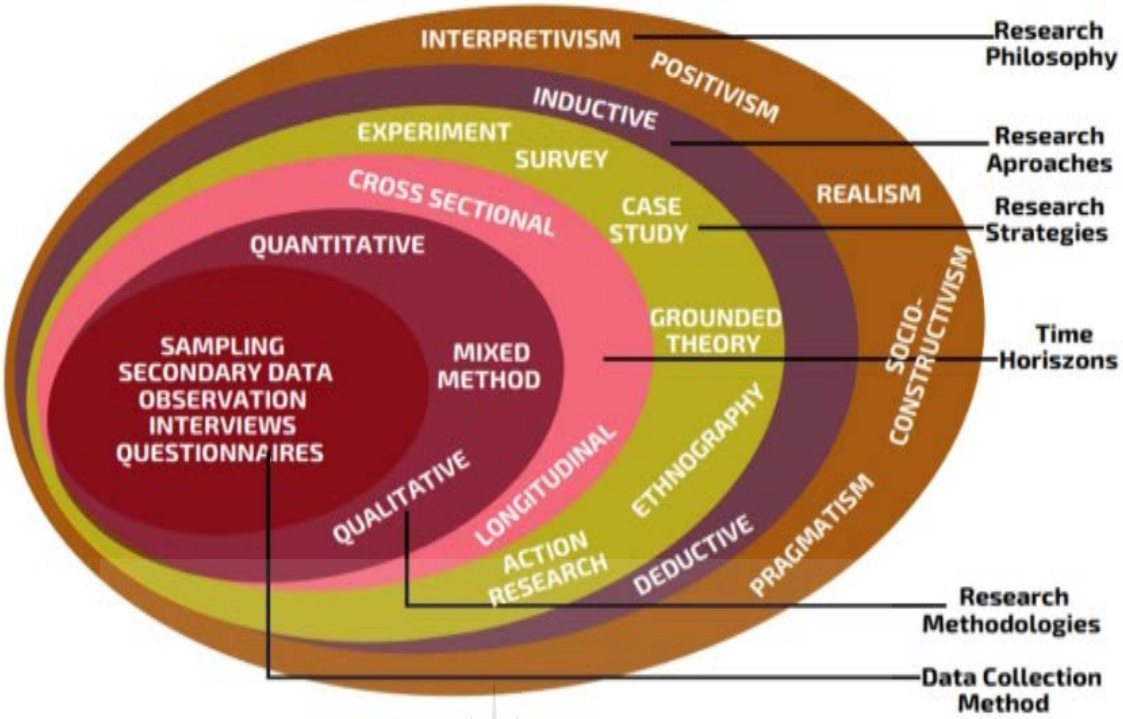

Figure 3-1 The research 'onion' principle adapted from (Saunders, Lewis, & Thornhill, 2016:128)

3.2.2 Philosophical assumptions implicit in the research onion principle

The outer layer of the onion allows for the selection of a philosophical world view that best fits the researcher's stance towards the research. The second layer comprises the research approaches, which are either inductive or deductive research approaches according to Saunders et al. (2016). In the third layer are possible permutations of research designs. The methodology or whether the study adopts a qualitative, quantitative, or mixed method are found in the fourth layer of the research onion, while the innermost layer relates to research decisions of sampling and data collection procedures such as observations, interviews, or questionnaires (Saunders et al., 2016).

3.2.3 The research philosophy

The external cover of the research onion is likened to what Saunders, Lewis and Thornhill (2016) consider the research philosophy to which the study refers or the world view within which the research is situated. Alexander (2016) defines a research philosophy as a philosophical world view within which every research study is located. Research philosophies for consideration include positivism, post-positivism, interpretivism, transformative, and pragmatism (De Vos *et al*., 2011: 309). Positivism and post-positivism

are often used by quantitative researchers to deal with research studies focused on an objective research ontology (Creswell, 2014).

The interpretivist philosophical stance adopted in this study accepts that reality is subjective and socially constructed. The researcher is able to appreciate subjective meanings of the social actions involved in the research (Nieuwenhuis, 2016). The aforementioned implies that the assumption implicit in this philosophy is that there exists a multiple subjective reality in research (Nieuwenhuis, 2016). Among the many and varied research philosophies briefly explained above, it is important to reiterate that an interpretivist philosophy, which as pointed out above appeals to the qualitative research process, was chosen on account of its ability to provide room for the researcher and participants to co-construct meanings in the research process (Leedy & Ormrod, 2012). Interpretivism is also known as social constructionism on account of its emphasis on the ability to account for human social action in terms of the social construction of meaning, which in this study comprised postgraduate Master of Education students who had to decipher their own subjective meanings of the factors they regard as fundamental in terms of their journal reflections. For Nieuwenhuis (2016:60), the creation of social reality involves interpreting the thinking processes made through journal reflections towards the metacognitive development of the postgraduate students as participants in a group of thought leaders in an online master's degree programme.

3.2.4 Research approach

Drawing from the research onion principle, this research study employs inductive reasoning. According to Saunders et al., (2016), the inductive approach is a way of investigating and comprehending the construction of reality and the meanings attributed to a social problem by individuals or groups by way of reasoning from the particular to the general.

3.2.5 Research strategy

A research strategy is the plan of action that connects research methods and outcomes to guide a researcher in planning and executing a study. Popular research strategies include experiments, surveys, action research, grounded theory, ethnography, archival research, and case studies. This research adopts a case study as a strategy to gather information as it allows the researcher to delve deeper into the phenomenon under

investigation when compared to other strategies. Yin (2012) and Leedy and Ormrod (2012) believe that employing a case study as a research strategy allows for the use of numerous sources of information to be collected and examined and thus make the findings more reliable and trustworthy. This is attributed to the rich descriptions that characterise the reporting in case studies in general (Nieuwenhuis, 2016).

Maxwell (2012) contends that case study research is flexible as it allows for flexibility in describing and analysing the participants' thoughts, views, and ideas as captured during the empirical study itself. Bertram and Christiansen (2014) are also of the opinion that a case study design offers researchers the chance to study complex phenomena within their context. Yin (2012) adds to this by saying that such a methodology also allows for an in-depth analysis of a given study scenario, or organization, for which it offers an in-depth analysis of the research focus.

3.3 Research methodology

There are basically three research methodologies: *qualitative, quantitative, and mixed methods design* (Saunders. Et al. 2016). However, each of these methodologies has what Nieuwenhuis (2016) calls strategies of enquiry, or what Bertram and Christiansen (2014) regard as design genres. According to Creswell (2014) there are five main qualitative research designs namely narrative, ethnography, phenomenology, grounded theory, and case studies.

This study draws on Yin's (2012) view that a qualitative case study research allows a researcher deep analysis of the case; therefore helping the researcher to pay attention to the analysis of the meaning participants attached to their experiences and challenges. The choice of the aforementioned methodology was motivated by the need to generate an in-depth analysis of the postgraduate students' journey of becoming thought leaders in their discipline (Leedy & Ormrod, 2012).

3.3.1 Population and sampling

The population for this study consisted of postgraduate students studying for their Master of Education Degrees in Information, Communication Technology (ICT) who were enrolled at University of Johannesburg during the 2018/2019 period. From the cohort of 87 students, the work of five participants were purposefully sampled. The reflective

journals considered for the study were sampled from two of the eight modules covering content related to educational reform and policy development in the ICT space. The criteria for selection was based on student grades, with those achieving above 75% viable for inclusion in the sample. An additional criterion was the number of individual journal reflections of each student and the average length of these reflections. Those that reflected more often and had lengthier reflections were specifically targeted for inclusion in the sample. Individual M.Ed. students are expected to complete journal reflections regularly as they journey through the module content. Even though students were only expected to complete four reflections per module, some students found the process so valuable, that they reflected more often, thereby exceeding expectations. Instructions for journal reflections are provided in Appendix H. Blackboard as a Learning Management System is used as a vehicle of online curriculum delivery and, as such, individual journal reflections are captured making use of the journaling tool.

3.3.2 Data collection methods

Bertram and Christiansen (2014) regard document analysis as a credible method of qualitative research data collection and include historical records, multimedia, written reflections, recordings, images, etc. In this study, documents such as student records, student journal reflections containing mainly words and images, user data such as time spent on task, and feedback from the facilitator or teaching assistants were considered, analysed, and assigned meaning by adopting an interpretivist philosophical stance. Direct observations, which Nieuwenhuis (2016) defines as a careful scrutiny of the participants' records, will also be used to ensure that the participants' journal reflections, records of marks, and time spent on each reflection activity provides vital information as part of the research focus, or to give the researcher an in-depth or well-detailed view of the participants' thoughts and ideas as captured in each reflection.

3.3.3 Data analysis technique

According to Oka and Shaw (2010:4), data analysis is one of the primary aspects of the research process where all the collected data is interrogated and collated to derive general observations accompanied by rich descriptions to substantiate decisions when assigning meaning. Qualitative research analysts such as Hesse-Biber and Leavy (2012)

maintain that qualitative data analysis ought to begin while the data collection process is still in progress. The process of document analysis involved a thematic approach where the text was assigned meaning in the form of codes. The researcher had 20 journal reflection documents to code of which each document ranged between 500 – 1500 words each. The average total number of words of these 20 journals was 800 words. The total number of words to be considered for coding comprised approximately 16 000 words. Each sentence was considered during the coding process. Codes were assigned to text that could assist in answering the research questions. A sample of such coding is presented in Figure 3-2.

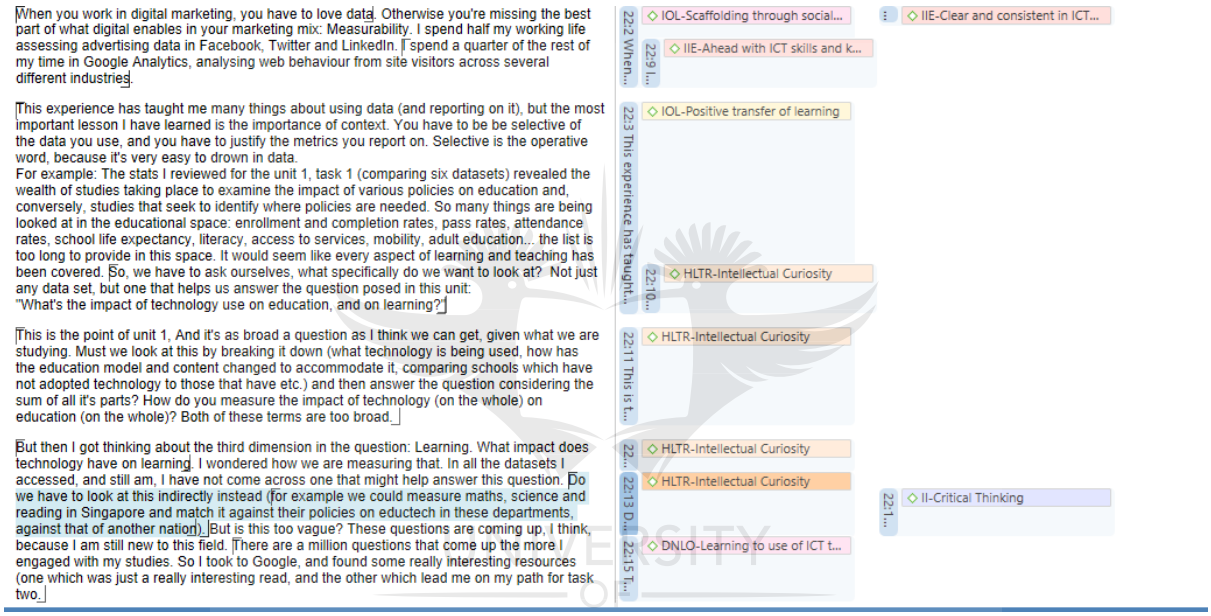

Figure 3-2 Sample of coding technique

These codes were later gathered into code families, or what Nieuwenhuis (2016) calls superordinate themes. These superordinate themes (presented in Table 4-1) then formed the foundation of the discussion of the findings as reported in the fourth chapter of this study.

3.4 Ethical considerations

Babbie and Mouton (2010) indicate that ethics refer to the standardized demeanour of a given profession. The data collection process for this study began with the researcher having to seek the necessary ethical clearance from the Faculty of Education Research Committee. As students' journal reflections were used, direct written consent had to be obtained from the selected study participants.

Creswell (2014) explains that those who participated in the study should have their privacy and confidentiality protected. The students received an informed consent form that included a cover page letter to explain the research process. Students' names, surnames, and students numbers appear in their reflection journals. The consent form stated that names, surnames, and student numbers would remain anonymous during data analysis and reporting. Students' individual identities were assigned a number. Their reflections were also numbered accordingly, for example Student 1 Reflection 1. By using pseudonyms, the participants' identities were protected and their anonymity and discretion were thus assured (De Vos, 2018; Wells, 2015). The data analysis process was thus conducted and some of the findings were reported as averages or grouped data, so as to avoid the possibility of identifying individual participants by their responses. They were also assured that the data generated would be used for the purpose stated in the consent form and no one other than the researcher would have access to the data or other identifiable information.

To obtain informed consent the researcher presented participants with an accurate, detailed, and full disclosure of the research purpose and process. Their confidentiality and reciprocity were also guaranteed. The consent forms were dated and signed by the researcher and the participants. Following LoBiondo-Wood and Haber's (2007) cautioning regarding the four ethical principles of autonomy, beneficence, non-maleficence, and justice, the researcher organised sessions in which the ethical considerations were explained to the participants. They were made aware of their right to autonomy in research and the right to know what was good (beneficence) and their direct benefits from the study (Bertram & Christiansen, 2014).

3.5 Measures to ensure trustworthiness

For this study, procedures to guarantee trustworthiness included triangulation and a carefully documented audit trail. Triangulation, in social sciences research, refers to the amalgamation of two or more theories, data sources, approaches, or investigators in one study of a single phenomenon to unite a single construct and can be employed in both quantitative (validation) and qualitative (inquiry) studies (Yin, 2012).

In this study, the researcher used information and methodological triangulations as set out by Hesse-Biber (2012) to ensure the trustworthiness of the study.

Other procedures adopted for this purpose were beginning the research process by conducting a trial study to test the consistency of the instruments for document analysis, triangulation, and crystallisation, which implies the use of several data sources (Richardson, 2010), corroboration of the raw data, keeping notes of the research selections taken, verifying and validating the findings, controlling for bias, avoiding generalisations, using verbatim statements (direct quotes from the participants), and maintaining confidentiality and secrecy. The summary of how these measures were adopted to ensure trustworthiness is presented in Table 3-1.

Table 3-1 Measures adopted to ensure trustworthiness of the study

STRATEGY ADOPTED	DESCRIPTION OF HOW THE STRATEGY WAS ADOPTED IN THE STUDY
Member checks	In order to amplify the credibility of the findings of the research, participants had the opportunity to evaluate and comment on the research findings, interpretations, and conclusions.
Triangulation	Through the use of numerous data sources, the researcher combined the data from the document analysis and observations. This helped to clarify meanings and to verify the reliability (Yin, 2012). The data gathered pointed to the same conclusions and this helped boost the researcher's confidence in the results.
Verifying raw data	During successive document analysis, the facilitators of the modules were asked to verify the authenticity of the data gathered.
Keeping notes on research decisions taken	The researcher kept a journal for capturing the key choices made along the research process, especially where the data collection and scrutiny process were concerned. This helped keep track of all the research reports involved (Nieuwenhuis, 2016).
Controlling for bias	Macmillan and Schumacher (2010), advise researchers to be cognisant of bias that can easily creep into a study. Techniques to prevent bias in this research tests on checking for alternative explanations. Discussing tentative findings with peers and keeping extensive memos of decisions.
Avoidance of generalisations	In a case study, the researcher seeks to provide not only an in-depth description of the research challenge from the participants' perspective (qualitative), but also provide insight into their participants' perspectives, experiences, attitudes, and behavioural patterns through paying attention to their actual words. Paying close attention to their inductive reasoning through exploring the research questions helped clarify the main focus of the study (Saunders, Lewis & Thornhill, 2013).
Using verbatim statements (quotes from participants)	The researcher followed Nieuwenhuis's (2016) advice in using participants' direct statements or answers to support information interpretation. At times, participants' voices were used verbatim applying *in-vivo* coding as a technique. In such cases, an interpreted meaning could not be assigned as

	the actual words captured in the journal reflection gave the most accurate account of a particular sentiment or thought.
Maintaining confidentiality and anonymity	The researcher deliberately avoided any data that could easily expose the identities of the participants and research (Babbie & Mouton, 2010).

The rationale behind subscribing to the measures as stated in Table 3.1 was to ensure the research confirmability, trustworthiness and transferability of the research outcomes of this study.

3.6 Summary

This chapter presented the research design choice as per the layers of the research onion as articulated by Saunders, *et al.* (2016). The interpretivist philosophy was explained and the inductive reasoning justified in the choice to condense data to patterns for interpretation. This chapter also captures the decisions in selecting a case study strategy to interrogate the participants' metacognitive development as thought leaders as they participated in the two *Educational reform and policy development* modules. A justification for the use of reflection journals as documents for analysis was covered and the typical qualitative coding technique described. Ethical considerations were presented and the processes followed to ensure research rigour explained. In the next chapter, a presentation, scrutiny, and discussion of the results of the study is proffered.

CHAPTER 4.

PRESENTATION, ANALYSIS, AND DISCUSSION OF FINDINGS

4.1 Introduction

This chapter presents the findings of the data gathered and analysed. Key themes listed in Figure 4.1 emerged from the data collection and analysis thereof. Before exploring the major findings as apparent in the themes shown in the Figure 4.1, it is important to note that six major themes resulted from the data analysis as captured through ATLAS.ti 8.

The following are the broad themes as they emerged: introspection in own learning; high level of theoretical rigour; engagement in learning (through collaboration), intellectual independence, development of new learning opportunities, and innovation in ICT

education. It is also important to note that each theme constituted a variety of codes or sub-themes as shown in Table 4.1. In other words, these codes are clustered into code families, or the equivalence of what Nieuwenhuis (2016) refers to as superordinate themes. In this study, these code families will be referred to as themes.

Subsequent sections in this chapter will provide a detailed discussion of each of the six emergent themes. These will be presented with direct quotes or verbatim statements as extracted from the participants' journal reflections to inform further deliberations.

Table 4-1: Graphic representation of emerging themes for the study

THEMES	**CODES**
Introspection of own learning	o Scaffolding through social media use o Positive transfer of learning o Evaluation of self-progress o Self-fulfilled with progress o Academic writing conventions
High level of theoretical rigour	o Intellectual Curiosity o Open-minded o Highly adaptive o Flexible thinking o Sense of being responsible
Engagement in learning (Through collaboration)	o Active participation o Meaningful participation o Importance of collaborative learning o Benefits of learning from others
Intellectual independence	o Critical thinking o Ability to share knowledge o Understand something instinctively without the need for conscious reasoning/strong intuition o Contextualising learning
Development of new learning opportunities	o Development of new learning insights o The effective use of ICT tools

THEMES	CODES
Innovation in ICT education	o Clear and consistent application of ICT expertise o Advanced ICT skills and knowledge o Adopt new technologies at an early stage

4.2 Introspection of own learning

Table 4.2 present the codes assigned to the theme, introspection of own learning, including their groundedness. Groundedness refers to the number of quotes assigned to a particular code. The resulting groundedness codes related to introspection of own learning are presented in Table 4-2.

Table 4-2 Groundedness of codes related to introspection of own learning

INTROSPECTION OF OWN LEARNING	GROUNDEDNESS SCORE
Evaluation of self-progress	16
Self-fulfilled with progress	11
Increased confidence in academic writing	6
Positive transfer of learning	2
Scaffolding through social media	1

As can be seen in Table 4-2, the code that yielded more text assigned to it is evaluation of self-progress (16), this was closely followed by the second code, which is self-fulfilled with progress (11). The third is increased confidence in academic writing (6), the fourth is positive transfer of learning (2), and the last code in terms of groundedness is scaffolding through social media (1). The expanded network view with associated codes and quotations is available in Appendix B as captured in ATLAS.ti 8.

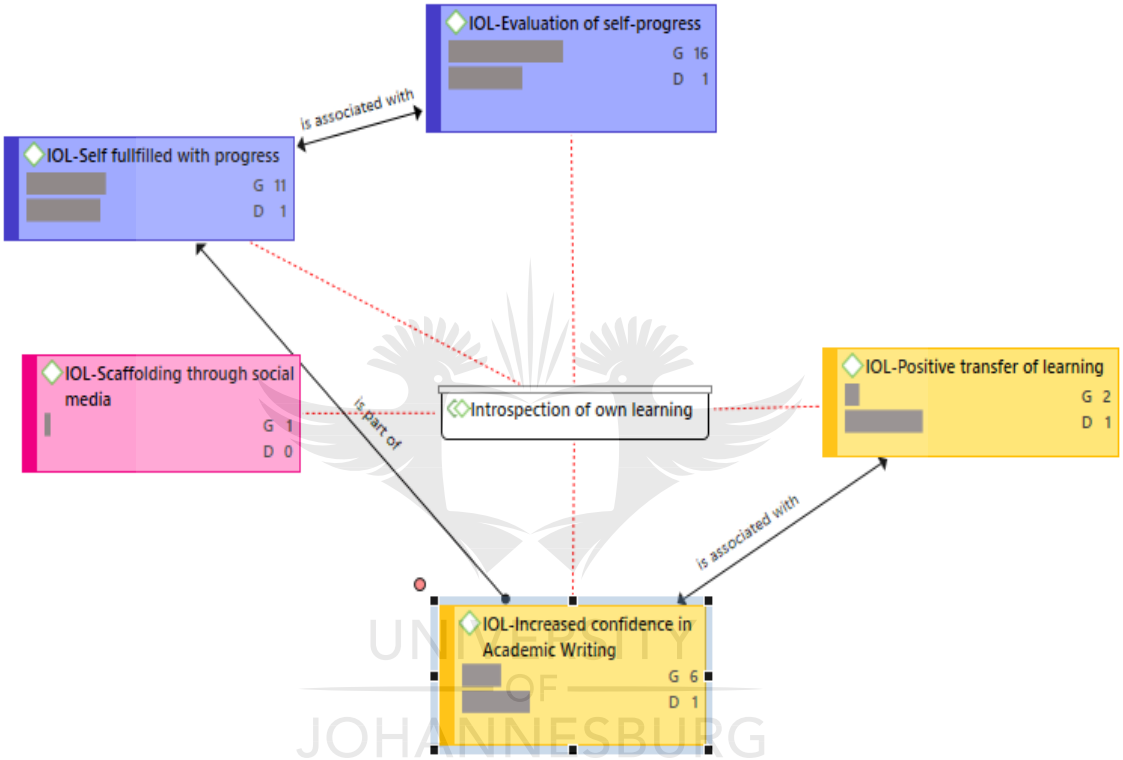

Figure 4-1: Network view of codes for the theme *Introspection of own Learning*

All similar illustrations, displayed as network views, were extracted from ATLAS.ti 8 after grouping codes into themes. In anonymising findings, 'S' indicates the student participant number, while 'R' denotes the associated reflection number, for example S1 R8 = Student 1 Reflection number 8.

It was clearly visible in the journal reflections that many of the participants treated these reflections as a way to carry out some form of self-evaluation of progress as the learning unfolded. From the analysis of the quotations assigned to self-evaluation of progress, it became evident that most of the students kept tracking progress and evaluating acquired ICT skills as they interacted with content. For example, being able figure out that your

recording product is not well articulated is a key sign of being self-responsible for your learning as evident in the following quote:

> "*As I completed and submitted my second task, I am realising once again how much I don't like being in front of the camera. I felt my delivery to be stiff, not very well articulated, and not very well enunciated. I mumble when I am uncomfortable you see, so I found when I watched and re-watched my video submission task, that my words weren't always clea*r" (S2 R2).

Some students do not only evaluate self-progress in learning but are self-fulfilled with the progress they make as they learn, this is noted when S2 R2 writes:

> "*I am actually looking forward to the next assignment. It seems more substantial and that makes me happy, it's comfortable, I understand what a paper entails, and that satisfies me. I have built enough new synapses this month anyway, who needs more?"*

Being able to monitor progress as you learn is not only attributable to dedication and self-directed learning, but also shows the characteristics of being a thought leader. Thought leaders do not only rely on content delivered (by facilitators) for online modules but they track their learning progress to ensure optimal self-growth and for the benefit of the organisation/s in which they serve.

Social media platforms are vast and serve a variety of purposes. Some participants use some platforms for self-empowerment in terms of career and to improve their use of ICT for learning:

> "*When you work in digital marketing, you have to love data. Otherwise you're missing the best part of what digital enables in your marketing mix: Measurability. I spend half my working life assessing advertising data in Facebook, Twitter and LinkedIn. I spend a quarter of the rest of my time in Google Analytics, analysing web behaviour from site visitors across several different industries"* (S2 R2).

The above statement portrays Facebook, Twitter, and LinkedIn as scaffolding platforms that enable the participant to move from the known to the unknown, which according to Vygotsky (1978) happens in a Zone of Proximal Development. The participant goes an extra mile to obtain information needed to strengthen his field of digital marketing. Drawn

from literature, thought leaders should stay abreast of emerging trends in ICT because their expertise are sought after and rewarded.

The comment made in S1 R1 is in line with the notion of the positive transfer of learning, which social psychologists such as Gibson (2010) claim occurs when a new learner realises the benefits of learning in one area and is then able to apply it positively in another for problem solving especially:

> *"Apart from the wealth of information I was able to obtain running the seven different reports on the two developing countries I selected, I learned how to use a new application - I would never have done this if it was not for this course. I never knew this information is available, freely, just waiting to be used"* (S1 R1).

Thought leaders should be in a position to realise when constructive learning is taking place so that they are able to answer/address some of the concerns relating to their areas of expertise within their organisations. They learn and transfer acquired skills and knowledge so that it influences the outcomes of their organisations positively (Tropf, 2015).They should also be able to demonstrate the ability to relate knowledge to the resolution of complex problems, as the South African National Qualifications Framework Amendment Bill (SAQA 2018) outlines.

Some participants pointed out that the online modules helped them develop a great deal of metacognitive skills and a high level of confidence in academic writing conventions. Some students feel that the learning journey helped them as they noticed great improvement in terms of academic writing, this is evident in the participant's comment.

> "*I notice that my technical writing has improved since the first module and I now better apply the APA system. My organizational skills and work experience, I feel helped me to manage the workload and finishing all my tasks and quizzes on time and as per schedule*" (S1 R7).

Increased Academic Writing is part of being self-fulfilled with progress as the participants monitor how they respond positively to learning. Thought leaders should possess good written communication skills, because they are likely to write electronic mails, memos, reports, documents, letters, journals, etc. as part of their job description. Possessing good written communication skills positions the participant to act as a thought leader in an area of professional practice in educational contexts.

The rest of the quotations under evaluation of self-progress, self-fulfilled with progress, increased confidence in academic conventions, positive transfer of learning, and scaffolding through social media are shown in appendix B, as generated by ATLAS.ti 8.

There is an overlap of relations amongst the codes under introspection of own learning as shown by means of arrows in Figure 4.2. As the researcher engaged with data, she realised that some of the codes link with each other. It is important to note that evaluation of self-progress and self-fulfilled with progress are associated codes as they both relate to awareness of self-learning and taking charge. Increased confidence of writing is associated with positive transfer of learning because participants are able to transfer their acquired writing skills into work related writing experiences. Increased confidence of academic writing is part of being self-fulfilled with progress because new learning has taken place.

4.3 High level of theoretical rigour

Clustered into the high level of theoretical rigour theme were the codes: intellectual curiosity; open-minded attributes; highly adaptive; flexible thinking; ability to solve complex problems; and sense of being responsible. The resultant groundedness of these codes are presented in Table 4-3 and the relatedness between them displayed in Figure 4-2.

Table 4-3: Groundedness of the codes from *High level of theoretical rigour*

High level of theoretical rigour	Groundedness score
Intellectual Curiosity	31
Open minded	13
Flexible thinking	10
Ability to solve complex problems	3
Highly adaptive	3
Sense of being responsible	2

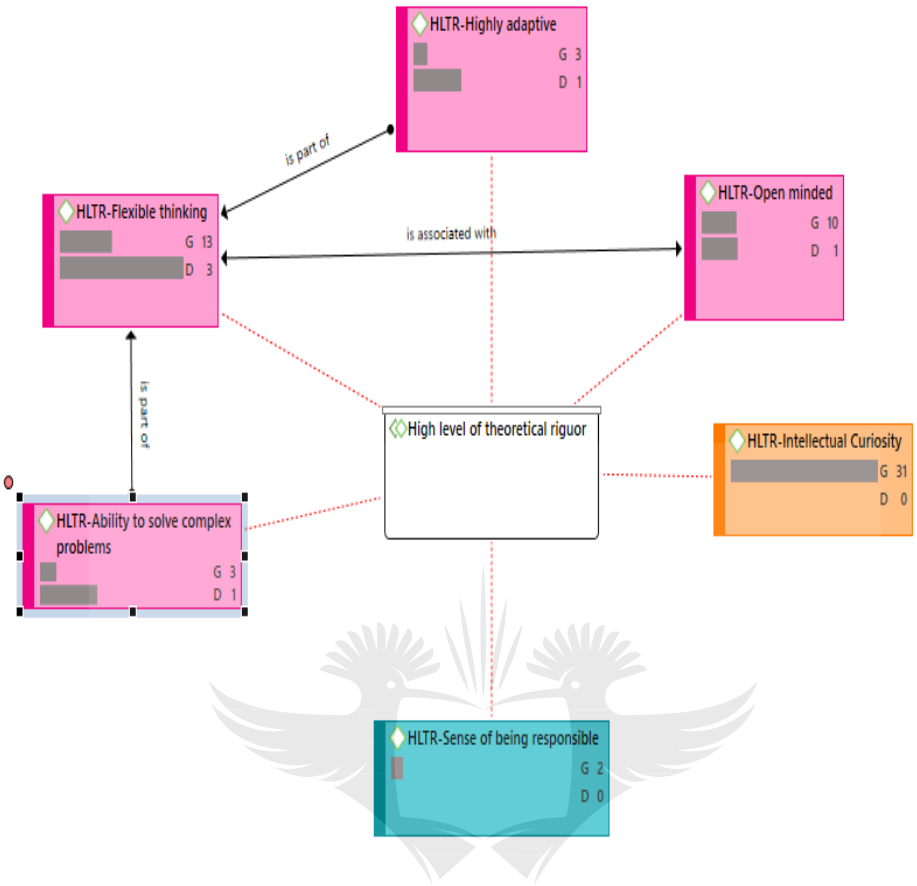

Figure 4-2: Network view of codes for the theme *high level of theoretical rigour*

The groundedness scores, as shown in Table 4-3, indicate high curiosity as the leading code (31), followed by open-minded (13), then flexible thinking (10). There seems to be a huge gap between the already mentioned codes compared to ability to solve problems (3), highly adaptive (3), and sense of being responsible (2) as all these codes are below 5. The quotations for high level of theoretical rigour as extracted from ATLAS.ti 8 are shown in Appendix C. Links among the explained codes are illustrated by means of arrows in Figure 4-2.

Given the reasoning from the following extract, it is quite apparent that the participants expressed a high level of understanding of the theoretical rigour involved in their online learning activities during their learning initiatives. The following quotations show the high level of reasoning students portrayed as the learning unfolded:

> *"Then I need to use that raw data to measure the success of my campaign. What was right, what went wrong, and how does the data support either of those*

theories? I have to draw insight by inferring information from my data, based on the context in which it was generated. So why can't I treat my assignment the same way? (S 1 R6)

The student appears to be intellectually curious as he reflects on what he has learnt, also considering as to how future activities will be impacted by this insight. The above extract shows that making sound inferences need to be guided by a sound theoretical rigour within which the analysis of the learnt concepts will be located. In fact, the above view shows the importance of the socio-cultural perspective adopted as one of the lenses for the study, particularly its contribution to the explication of online learning activities as a form of mediated learning experiences, a theoretical concept Vygotsky (1987) maintains is necessary for all learning activities. Curiosity is an important ingredient of the learning process, therefore the minds of intellectually curious students are always active. This is evident when the student reflects that:

"I would consider the following questions before I begin:

What does the policy aim to enable?

Who are the stakeholders that will be affected by / stand to benefit from the must consider about a given subject and the place in which it operates in a system)? policy?
Does the policy accommodate the greater ecosystem in which the subject lives (i.e., is it contextual, and does it accommodate all elements that one)" (S2 R3).

Intellectual curiosity is related to critical thinking, critical thinking falls under intellectual independence, which will be unpacked in the upcoming paragraphs. Intellectualy curious students tend to be critical on matters that do not only concern their areas of expertise but the country at large, it is evident when the student reflects in this manner

"*Why have the data if we do not use it? What angers me is why we do not use it, we as in SA gov. Moreover, if we do, are we running the wrong reports? How can we not be learning from the information available from other 'educational superpowers' out there"* (S1 R2).

Being an emerging scholar requires students who are flexible thinkers with the ability to come up with alternative learning measures to ensure learning takes place.

"I tether my phone to my laptop so I can continue with the task and make a submission. I log another call and carry on with my assignment. I submit, create a journal entry, and then submit to my boyfriend's insistence that I have a nap (my favourite Sunday past-time and something he encourages me to indulge in because we both know when my name becomes Mom, there will be no napping for a few years). So I do. Wake up and carry on my work.... tethered to my phone" (S2 R5).

The above quotation indicates as to how the participant takes pride in his learning and how he is open for new learning development opportunities. Flexibility, thinking out of the box, and creativity intertwine and are characteristics that thought leaders should have (Alhaddi. 2014).

Flexible thinkers can even benefit institutions on how qualifications can be distributed amongst campuses as recommended in the comment below.

"*….., for two weeks I spent some time at each of our campuses conducting our annual academic quality assurance visits, in a nutshell, it's fundamentally important that the kind of qualification offered on one campus is exactly the same in every respect as the qualification offered on another campus, academically, ethically, and managerially." (S3 R3)*

Thought leaders are open-minded, as is evident in the following quotations.

"I figure there are two ways to fix this (over and above being forced into situations where I need to become comfortable with things):

Practice and film myself until it looks like it's coming naturally

Make sure I have something very interesting to say (otherwise, what is the point of filming yourself)." (S2 R2)

The participant exercises various options in order to perfect the task, being open-minded is one of the key virtues that challenges critical and flexible thinking and should be possessed by thought leaders.

One of the insights drawn from the Minimum Requirement for Teacher Qualifications (MRTEQ) document requires the completion of a professional Master of Education

degree (M.Ed.) in ICT to include the demonstration of the ability to relate knowledge to the resolution of complex problems in an area of professional practice in educational contexts. This ability is demonstrated in the following comment.

> "*I decided to review the data on literacy, specifically for mathematics, science and reading. I now needed to find six data sets that would help me to measure these three literacy types. This was a task I realised I would need much more time for. So instead, I went back further, and decided to rather have a column when comparing all six data sets on what they measure (so instead of finding six tests that measure literacy, I rather have a column for each of the six sets outlining what they do measure). That was one of many different things I used as comparative information" (S2 R1).*

The researcher previously indicated that most of the codes in this study overlap. The quotation above demonstrates skills like critical thinking, intellectual curiosity, flexible thinking, and open-mindedness being applied in order to solve curriculum-related problems within the educational context.

Some students are proactive and have a sense of being responsible as the comment suggests.

> "*On the other sphere, it means that I often end up taking the lead on things. I have seen this happen with my group tasks: Because I misunderstood the project deliverables, I created one version of a project plan. As a result, I have held the group up. I took the responsibility so it rests with me, but it's raised a concern: What happens when people rely too much on one person. That person who assumes a leadership role must then ensure they know everything they need to know to properly coordinate the activities. We're going to have another call tonight to go through this error and get back on track. At this level, we will now be assigning individual activities which will reduce the amount of pressure I have put on myself to be a project manager for this task. Not that I am complaining - after all it's role I stepped in to. No one forced me to" (S2 R7*).

These sentiments are an indication that the student displayed some thought leadership characteristics, as he is able to identify the problem well in advance and come up with a remediation strategy. Traits like initiative and flexibility are highly expected from

organisational leaders. The manner in which this student reflects is a sign that he is capable of leading not only himself, but also those that he is associated with.

Being able to adapt means you change yourself or thoughts to accommodate your situation. Being able to adapt to new meaningful changes also offers the participant an opportunity for new learning insights, this is evident in this quotation.

> *"I was sure I was going to get my group to use my topic ideas like the one.... yeah, that did not work. I never saw this coming; we had an amazing moment when the topic just 'happened.' We created it as a group from our discussions, and it excited not just me, but all of us" (S1 R6).*

This particular quotation provides a good example of learning through social interaction, hence the participant was able to learn from others and this is known as co-construction of knowledge.

4.4 Engagement in learning

The emerging codes that point to the theme of engagement through collaborative learning as drawn from the analysed participants' journal reflections included the following aspects: meaningful participation, the benefits of learning from others, the importance of collaborative learning and active participation. The codes and their resultant groundedness are presented in Table 4.4.

Table 4-4: Groundedness of the codes for *Engagement in learning*

Engagement in learning	Groundedness score
Meaningful participation	9
Benefits of learning from others	8
Importance of collaboration	6
Active participation	3

In Figure 4-3, the inherent relationships between codes are indicated by means of arrows. The expanded network view with associated codes and quotations for the theme engagement in learning is available in Appendix D as captured in ATLAS.ti 8.

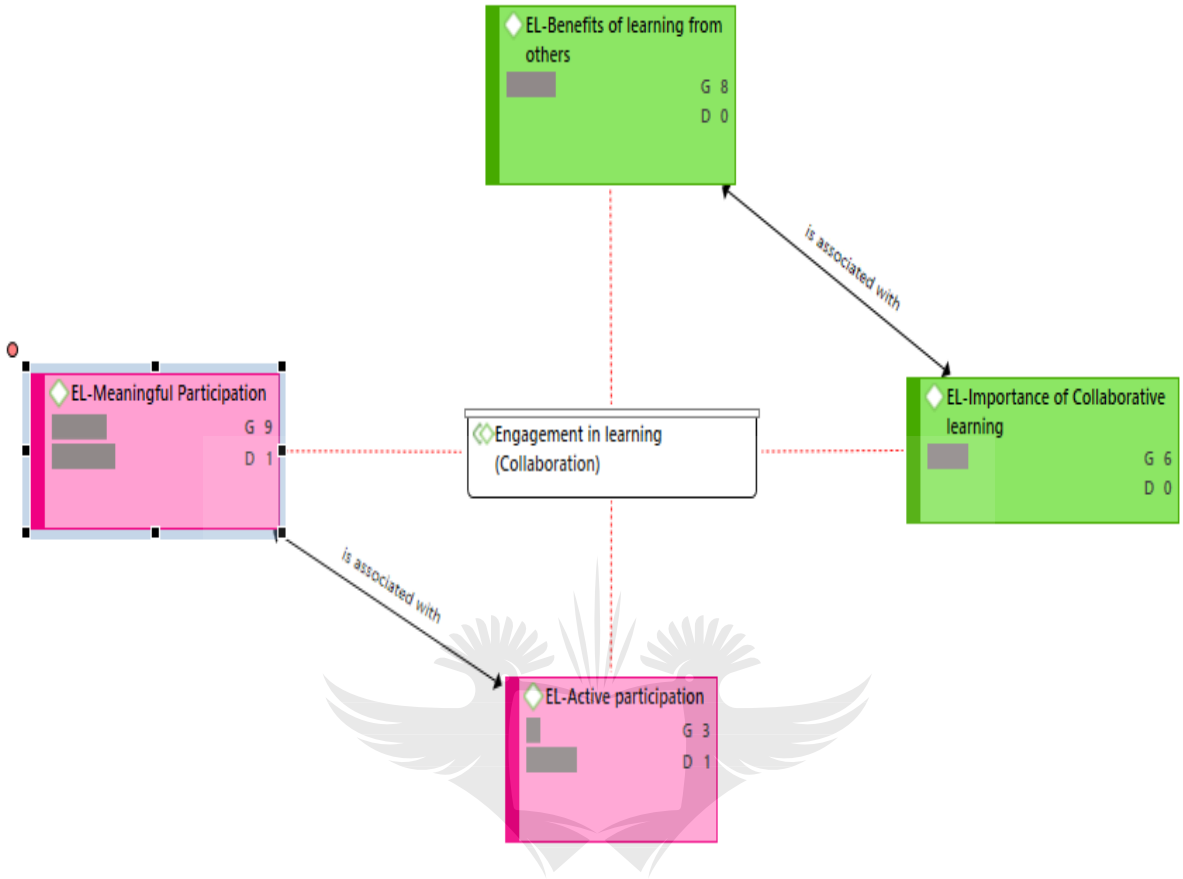

Figure 4-3: Codes used for Engagement in learning

As can be discerned from the below extracts, extracted from ATLAS.ti 8, the participant's view demonstrate meaningful participation.

> "*I also found some super cool resources which I have added to the group file exchange, including some templates from the 2018 MLW event, as well as some regionally-relevant content*" (S2 R5).

The contribution made by the student is meaningful as he/she is able to introduce resources that will assist the group in terms of learning, new learning opportunities prevail as the rest of the group members are introduced to new tools that will possibly benefit them, even in future learning. Meaningful participation is when some students apply flexible thinking in terms of mediating collaborative learning. This is evident in the student's comment.

"There always has to be a 'manager': While each person contributes significantly and meaningfully to the group, there should always be one person who takes ownership at a project management level. This person is not the boss, they are more like the secretary, making sure minutes are done and everyone is on the same page. It just makes things work better. In this exercise, that role was played by me; naturally as I am a professional project manager. I was happy to do it, and the group is super grateful" (S2 R8).

The above quotation is also linked to self-evaluation of learning (SEL) as the student is aware of the role they plays towards upholding meaningful learning. It is not all students in a group who can champion quick ideas towards collaborative learning, but they can still be actively involved so that they gain skills and knowledge once collaboration has taken place. One student comments:

"The group exercise was a really wonderful one, and while I was reluctant at first, I now have a deeper understanding that policy development success depends on the active engagement of multiple stakeholders. One person simply cannot do the entire thing - we are working in a multidisciplinary space with technology and education. We therefore need people from multiple different disciplines to make it work" (S2 R8).

Some students acknowledge the importance of collaboration and the benefits derived from such engagements. The following views are extracted from the data

"I sit here in New York tonight, writing my final journal entry for this course, sadly. What a rollercoaster ride this has been... but only the part when you come down when you cry and screen, and cry a little, that feeling of euphoria. "*This past week I was able to submit both Task 2 and Task 3, still not sure how I would have managed this without my group. I was truly blessed to work with an amazing group of people, and it was such a pleasure having the opportunity to lead the four of us through this journey...though most of it was in the dark :-)"* (S1 R6), and

"***Working in groups helps deepen understanding of different subject matter****: I may have project-managed like a ninja here, but I didn't cover myself in glory when it came to idea generation because I don't really work in a strictly educational setting. I work more in an industry-specific training setting. It was therefore very*

beneficial to me to be exposed to people who work in the context we are studying, and have their finger on the pulse" (S2 R8).

In all of the above extracts from the theme engagement in learning, participants expressed not only the significance of active learning, conscientious reasoning, the importance, and benefits of collaboration, but also expressed a great deal of the fun they had and the insights they developed from consensus thinking, decision making, and the amazing opportunities they enjoyed from the learning activities as well as the ability to communicate effectively with fellow group members. Analysed from the socio-cultural perspective, these views clearly lend credit to its adoption in the teaching and learning process, particularly its emphasis on social interaction as the mediators and learners co-construct their knowledge.

4.5 Intellectual independence

The codes for *intellectual independence* are critical thinking; ability to share knowledge; and understand concepts instinctively without the need for conscious reasoning or strong intuition and contextualising. The resultant groundedness of scores for the theme intellectual independence are presented in Table 4-5 and the interrelatedness subsequently depicted in Figure 4-4.

Table 4-5: Groundedness for codes of *Intellectual Independence*

Intellectual Independence	Groundedness score
Critical thinking	15
Contextualising learning	12
Ability to share knowledge	7
Understanding instinctively	5

There were more indications of critical thinking (with an assigned groundedness of 15), it is followed by contextual learning with a score of 12, then ability to share knowledge with a score of 7 scoring. The least assigned code is understanding instinctively with a score of 5. The expanded network view with associated codes and quotations is available in Appendix E for interrogation.

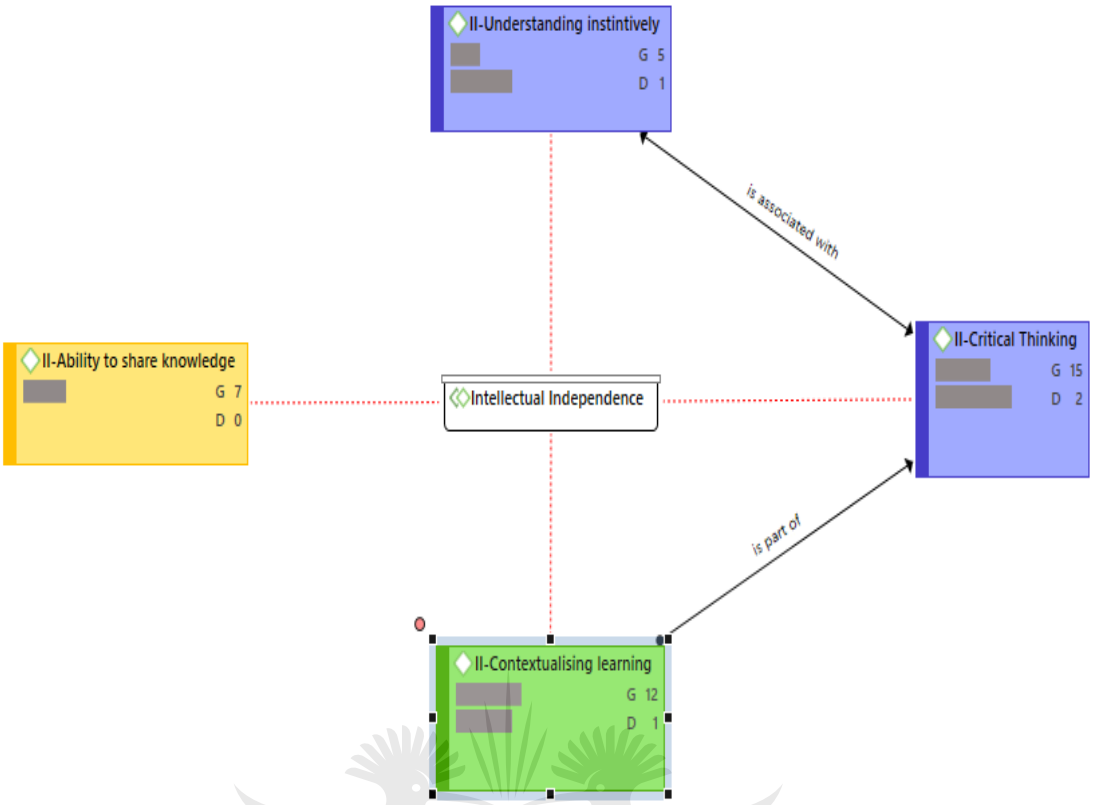

Figure 4-4: Codes used for *Intellectual Independence*

Analysing and evaluating in order to form judgement symbolises the possession of critical thinking skills that thought leaders should possess, as is evident in the following quote:

> "*You also can't just read any news report and think you know what's going on. That's just what politicians and news-owners want us to think. What we need to learn in school is how to access information and how to use it*" (S2 R2).

In as much as students are expected to learn as per the content is delivered but there are those who were critical of lecturing style as such they make good suggestion for improving task brief of activities as commented:

> *"Here I compared Task 1 with the tasks during Module 2 and Module 1. I feel that the tasks in Module 2 were more clearly stated, I knew exactly what I had to do, inclusive of the starting point and ending, the length of the assignment and level of detail required, I had a clear rubric and more. I was not uncertain. In contrast Assignment 1 in Module 3, I felt more 'lost'. Though we had a rubric, for me I did not feel the task brief provided sufficient and clear guidelines on what needs to be*

achieved, I felt uncertain throughout the process as we had no best effort example to use as a guide. Now, as I wait for the results I am more and more anxious, did I start the timeline early enough or too early, did I end it too early or not late enough. The timeline incidents - did I have only to indicate an event or provide a substantial narrative for each? The Mind Map assignment in Module 1, the video assignment in Module 2, and Assignment 1 in Module 3, for me, have these factors in common" (*S2 R5).*

The ability to identify certain gaps in terms of how the module is presented symbolises thought leadership qualities.

Not all students only learn for the stake of submitting work, receiving a grade, and completing the course, some students contextualise what they learn; as can be seen in the quote: "Here in Kuwait when a policy is created (private sector), a single person writes it, the CEO or GM approves it, and it is applied," (S1 R7). This implies what is delivered in the module also relates to the participant's context. The statement portrays the participant as being able to compare the module content with what is happening in their context.

Learning is evident when what is learned is shared for the sake of improving the quality of work in the respective organisations: "I think I was able to bring a new clarity to the quality assurance process, for the betterment of our curriculum understanding*,"* (S3 R3). This statement suggests that the information on the processes of quality assurance was not enough. After the participant engaged in Education modules, he was able to impact organisation in a meaningful manner. The following participant believes in knowledge sharing: "What excites me most though is that I can share this knowledge with other educators who still believe, as I do, that we can make a change to our future*,"* (S1 R2).

Some students are instinctive as they can understand things without conscious thought, as the following quotation displays: "…because I have now seen this module as a journey through the world of data, for the video task 4, I decided to select the questions relating to the ownership and ethical use of big data," (S2 R2). This writing suggest the experiences of the participant easily make it easy for him to make conscious decisions about the upcoming activities. The participant is able to prevent challenges for the next activity as the decision is informed by previously learned knowledge. Here is another quotation that speaks to instinctive understanding: "If we are to compete on a global level,

as the M&G outlines, we must participate in these studies to gauge the literacy skills being measure (for TIMSS it's mathematics and science)," (S2 R1).

4.6 Innovative in ICT education

The following codes were clustered in the theme innovation in ICT education*:* clear and consistent ICT expertise, ahead with ICT skills and knowledge, and being able to adopt new technologies at an early stage. Table 4-6 reflects codes and their groundedness for this theme.

Table 4-6: Groundedness of the codes for *Innovative in ICT Education*

INNOVATIVE IN ICT EDUCATION	GROUNDEDNESS SCORE
Clear and consistent in ICT field	17
Ahead with ICT skills and knowledge	5
Adopt new technologies at an early stage	2

As can be seen in Table 4-6, the code that yielded more text assigned to it is clear and consistent in ICT field (17), this was closely followed by the second code, which is ahead with ICT skills and knowledge (5), and the last code in terms of groundedness is adopt new technologies at an early stage (2). The expanded network view with associated codes and quotations is available in Appendix F as captured in ATLAS.ti 8.

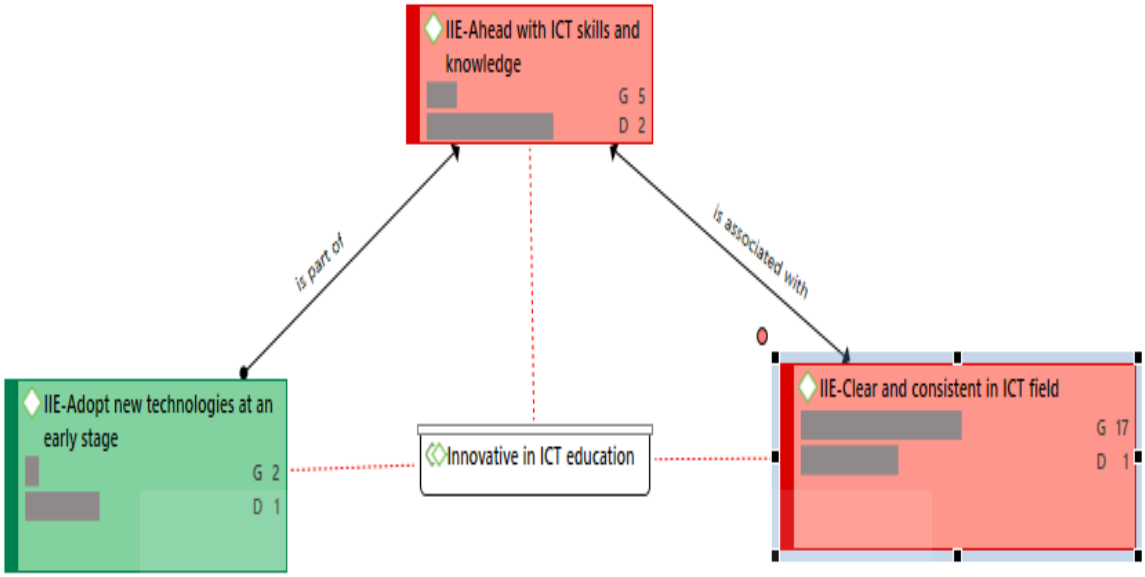

Figure 4-5: Codes used for *Innovative in ICT education*

From the reflections made by the participants, it is evident that some ICT teachers are clear with ICT skills and knowledge. This is evident when the student comments:

> *"The Trinity e-Learning Platform has CAPS aligned video's (7 000 hours) and Pdf lesson plans (3 500) from content providers such as Numeric Offline, Mindset Learn (DSTV Learning Channel), Bubblegum Edutainment, Wikipedia Offline, to mention a few"* (S2 R4).

The quotation above implies that some students are abreast with CAPS resources and platforms that offer resources needed for teaching and learning. Some students do not only familiarise themselves with ICT skills, but also stay up-to-date with statistics in terms of the digital divide: "….only 28% of schools have access to IT infrastructure to facilitate e-learning. That's from a total 28 000 schools. Meaning 72% of schools have no IT infrastructure," (S2 R4).

Reasoning from the quote below, some students are advanced in terms of using ICT tools "I spend a quarter of the rest of my time in Google Analytics, analysing web behaviour from site visitors across several different industries," (S2 R2).Thought leaders should have advanced skills and knowledge pertaining to their areas of expertise. The participant

also demonstrates analytical skill as he is able to analyse web behaviour of different industries.

Some students are capable of using applications in their phones for a variety of reasons.

> *"This experience got me thinking. I have spent four days with only my phone as a connection point. Trying to do a higher degree, trying to run my business, trying to plan my wedding,*" (S2 R5).

> *A Google shared document was used to project manage our task. Also, we also decided to use Coggle to brainstorm on the topic, share ideas, and more. Mostly the Coggle was used unpack the topic; this worked out great. Everyone worked on it as and when we had the time, adding information, ideas, and more. I would recommend this to future groups undertaking this task. Our group also used the file share functionality in the group,"* (S1 R6).

The view of S1 R6 indicates that by using Google, they were able to share some documents, to project, and manage their tasks and to brainstorm the given topics. They were also able to share ideas and show how being innovative in ICT education can be used to unpack important topics and to ensure many students work collaboratively to create opportunities, add information, and new ideas. These aspects are central to the development of metacognitive skills (Prensky, 2010).

> *"So in concluding this reflection I will just say that this approach provides a great model for me to think about how CASME structures its online learning programmes, how the development of competence and skills can be scaffolded using the ICT tools to foster engagement and collabor*ation," (S4 R1).

It is clear from the extract above that some participants were able to develop clear and consistent expertise in ICT use as a result of innovative exploits that were used in the online learning activities. This finding is consistent with the literature review examined in this dissertation, particularly the views expressed by Prensky (2010) and Vygotsky (1987) that metacognitive development emanates from social interactions through guided learning within the students' ZPD and their more knowledgeable others, which help in the co-construction of knowledge and understandings. As can be deduced from S4's

reflective journal, the use of ICT tools helps foster student engagement and collaborative learning initiatives in the classroom.

Herndon and Kor-Sins (2019) are of the view that thought leadership manifests in highly learned people in a variety of ways, with some thought leaders being quiet innovators possessing highly influential skills, while others need to demonstrate the merits of their ideas, and yet other thought leaders are not personally creative but adopt new technologies at an early stage. This extract demonstrates the expert use of new technologies at an early stage for a variety of meaningful purposes:

> "*I've explored how I grew up with technology, am used to it. But what I have not explored yet is how I have come to rely on it. As a child, tech was there to help out. Now, it's literally what we live our lives through. For example, when I am out of the house, I can draw money with my phone. I can find the location of the place I need to be through my phone (and these days cannot actually find anything without my phone). I can find my car with my phone. I can order transportation if I do not have my car. I select shops, restaurants, products, services through technology. I find recipes before I cook, find information before I attempt to give an answer. This week, while I only had my phone, I could barely function,"* (S2 R5).

The above quotation implies that even experienced users of contemporary technology can still be surprised as they discover new affordances associated with their work and personal lives. The fluidness of transferring skills from one domain to the other as mediated through everyday technology is becoming more pronounced. The same tools to advance critical thinking, seeking information, and curating resources are also used to advance and manage personal projects.

4.7 Development of new learning opportunities

Codes assigned to the development of new learning opportunities include development of new learning insight and learning to use ICT tools effectively. These, along with their groundedness, are presented in Table 4-7.

Table 4-7: Groundedness of codes for *Development of new learning opportunities*

Development of new learning opportunities	**Groundedness score**

Development of new learning insight	20
Learning to use ICT tools effectively	6

The code that yielded more text assigned to it is development of new learning insight (20), the last code is learning to use ICT tools effectively (6). Associated relationships between these codes are shown in Figure 4.6 by means of arrows. The expanded network view with associated codes and quotations is available in Appendix G, as captured in ATLAS.ti 8.

For many of the participants whose journal reflections were analysed, issues to do with the development of new learning opportunities and learning to use ICT tools effectively were important to them as thought learners, which they all testified to have realised as evidenced in the extracts from their journal reflections given in the following verbatim statements extrapolated from their journal reflections. An illustration below display codes that fall under development of new learning. The codes are extracted from ATLAS.ti 8.

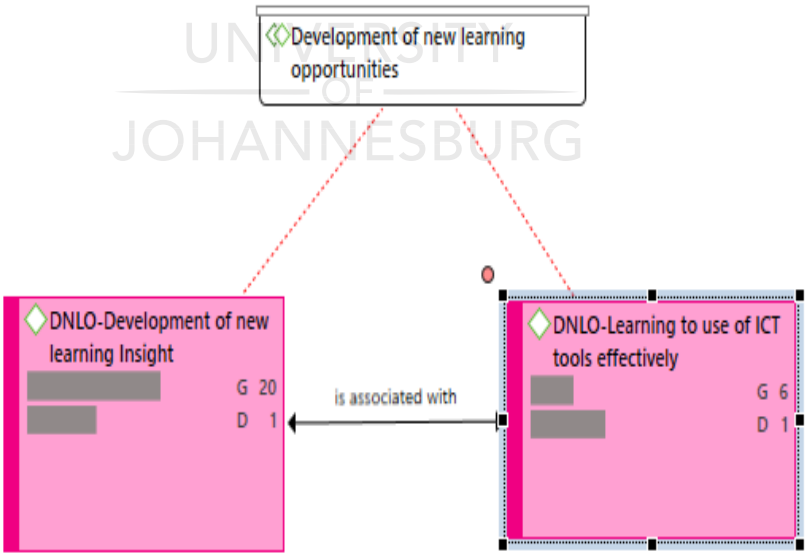

Figure 4-6: Codes for *Development of new learning opportunities*

> *"……am also learning that **policy-making** doesn't start and end with the policy document... policy-making transcends the policy document and this document*

then becomes fluid, dynamic - changing as the model rolls out. It cannot be static, but must change as we do," (S2 R3).

As can be inferred from the above statement, some of the participants were able to realise the importance of learning new insights from the use of journal reflections. My own interpretation of this view was that where students have an opportunity to interact under well-organised learning environments, they tend to collaborate effectively with each other in rewarding ways. The quotation also clearly evidences that some of the participants further noticed more pertinent views, specifically that the process of policy making is ongoing and does not happen as a single event but is a process that transcends the realisation of the resultant policy document. In their view this implies that the policy document does not become the final product but sets in motion new processes that unfold alongside the analysis and critiquing stages. It is perhaps in this light that some of the participants claimed that the policy document became fluid and dynamic depending on the ensuing changes that follow the process of its finalisation as a document for adoption.

"Then I need to use that raw data to measure the success of my campaign. What was right, what went wrong, and how does the data support either of those theories? I have to draw insight by inferring information from my data, based on the context in which it was generated. So why can't I treat my assignment the same way?" (S2 R1).

From the above quotation, one can see that the raw data emerging from the journal reflections can be used to measure the level of success in terms of indicating what is considered right, wrong, and how the data can be used to make inferences and support the theories identified and used in the process. The preceding statements clearly show that the value of journal reflections in student online learning programme is immeasurable. The reflections can reveal important insights that the facilitators and students can adopt to perfect the learning process and problem solving in the teaching and learning processes.

"I found this paper that did a great job of contextualizing datasets, their functions and their relationship to policy (also something I had ever considered … I actually assumed that policy had more to do with politics than facts and strategy before I started our last module). Written by Chris Van Wyk (2015), where the first part of

his paper is the briefest overview of educational datasets which inform policy," (S3 R1).

Further to the aforementioned, the journal reflections also revealed that they have an important role in the area of contextualising the educational datasets and in their functions and relationship to policy formulation strategies. The fact that the policy trajectory is always riddled with political manoeuvres has also been revealed through the journal reflections, as can be determined in the above quotation.

"There are a million questions that come up the more I engaged with my studies. So I took to Google, and found some really interesting resources (one which was just a really interesting read, and the other which lead me on my path for task two" (S2 R2).

It is evident from the quotation above that journal reflections are a learning motivation tool that stimulates important research topics and issues for discussion and thought processes as well as providing crucial opportunities for students to compare notes or share learning experiences from their diverse socio-cultural backgrounds. Many educationists would prefer learning tools that enable such a level of metacognition in their fields. The journal reflections promoted the student participants to want more answers to questions; this implies their role in the online learning programme is invaluable.

4.8 Summary of findings

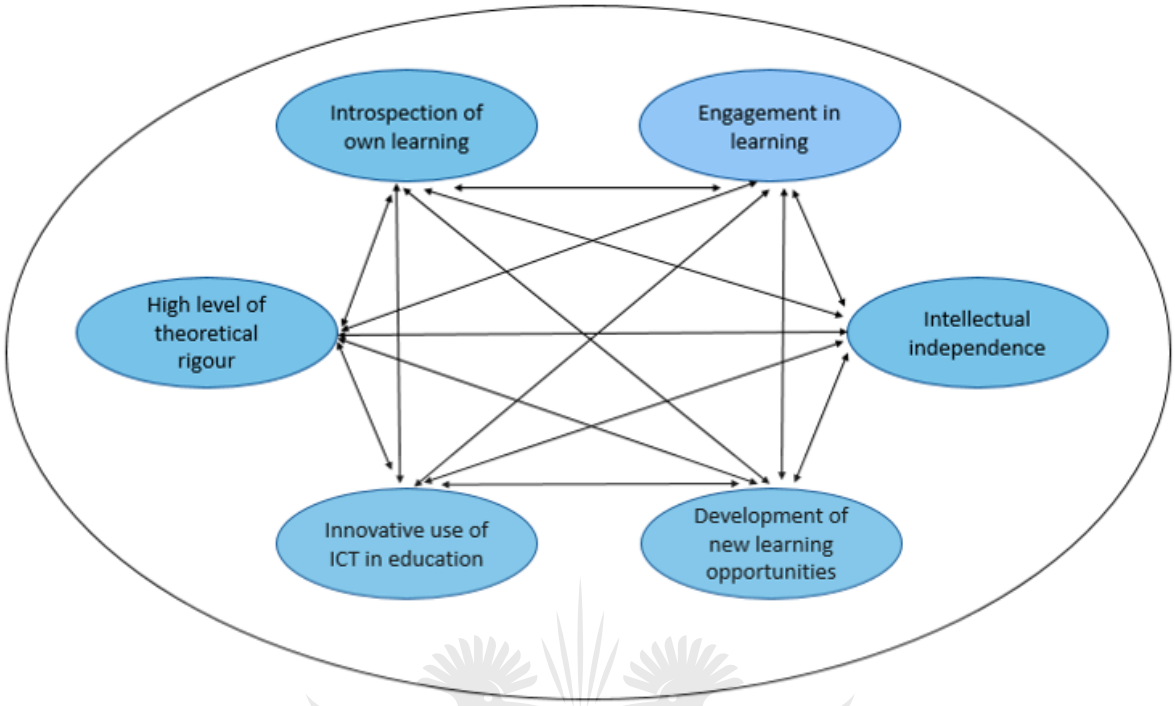

Figure 4-7: A conceptual model of postgraduate students as thought leaders

This section focuses specifically on the emerging themes and characteristics of postgraduate students as thought leaders in relation to the literature. The following postgraduates' (thought leaders) characteristics, as derived from literature, are examined. Thought leaders display the following traits: quietly innovative and flexible, adoptive to new or emerging technologies, demonstrate excellent ICT skills, they understand ICT matters instinctively, are creative thinkers, brainstormers who can think outside the box (critical thinkers), who stay abreast with emerging technological developmental trends, possess coaching, and a sense of responsibility.

The discussion therefore proceeds by looking at how each of the aforementioned traits fits into these themes; introspection of own learning, engagement in learning, intellectual independence, development of new learning opportunities, innovative use of ICT skills and a high level of theoretical rigour. The summary unfolds with a discussion of thought leaders as a quietly innovative and flexible group.

4.8.1 Thought leaders are early adopters of new or emerging technologies

Herndon and Kor-Sins (2019) claim that thought leadership ought to exhibit high levels of technology skills especially in the way they use technology to mediate activities in various spaces they occupy. Emergent themes from this research support this notion in the introspection of own learning, engagement in learning, and the development of intellectual independence, which implies that all facets as described herein fit well in enabling the postgraduate students as thought leaders to do an evaluation of their own technological levels of competence. As learning unfolds, they are early adopters of new technological developments such as tools and services as they seek higher levels of intellectual independence and give expression to their creative thinking. They also seek out spaces to share their new learnings with others, thereby further demonstrating their emergent thought leadership.

It emerged from this study that as thought leaders, postgraduate students in online learning programmes need to catch up with new or emerging technologies to be able to serve as champions of ICT skills in education so as to inspire effective educational leadership, reimagine new technological ways, dismiss technological myths and show their followers what Alhaddi (2014) refers to as new technological pathways for the future. The above view is in line with the sentiments by Margery and Ginsberg (2014).

It is expected that postgraduate students practicing in the ICT in Education domain should be at the centre of exploring developments in new and emerging technologies to ensure that they come to terms with understanding their affordances. Therefore they can provide leadership when these tools and services are applied to education, especially in education and the ICT domains. The view also links with Alhaddi's (2014) idea of the need for post graduate students in an ICT environment to ensure they are abreast with developments in new technology learning opportunities and that they exploit all of the affordances of these innovative applications. This view lends credit to Adey and Shayer's (2013) contention that all thought leaders need to be adaptive to almost all modern and emerging technologies if they are to function effectively in their everyday activities.

4.8.2 Thought leaders as demonstrative of excellent ICT skills

Margery and Ginsberg (2014) state that thought leaders in the education industry must not think of teaching or learner facilitations as a one-way process, instead they need to

impart knowledge to learners. Their knowledge of 21st century skills should empower them to realise and demonstrate the importance of online learning as one of the strategies for enhancing the development of metacognition skills. This view resonates with Amory's (2012) contention that ICT mediated teaching and learning offers important policy implications and insights for classroom practitioners and students. It fits well in the broad theme of enhancing a high level of theoretical and practical rigour, which is fundamental to all learning activities given the rate at which it fosters the development of reflective and metacognitive skills in learners. In line with the views by Donald, Lazarus, and Lolwana (2012), this clearly shows that thought leaders need to demonstrate the fact that skills such as metacognition are functional products of online mediated learning experiences.

4.8.3 Thought leaders capable of understanding the complexity of ICT uses

From the analysis of journal reflections, it became apparent that thought leaders should be individuals recognised as authorities in their specific subject areas. It is therefore my considered view that these postgraduate students, as active experts in the field of ICT in Education, should be able to use their knowledge and abilities to bring significant chance as they work towards finding solutions to increasingly complex problems they encounter in their own learning ecosystems. Tropf (2015) notes that the skills they possess should be enough to enable them to build capacity and to influence the learning outcomes of many students and or colleagues they work with.

4.8.4 Thought leaders as critical thinkers

According to the findings of this study, thought leaders are creative thinkers capable of brainstorming and thinking outside the box. As thought leaders, postgraduate students are able to mediate effectively on issues such as creativity, collaboration, communication, information literacy, media literacy, technological literacy, flexibility, leadership, initiative, productivity, and social skills. All of these require them to negotiate their everyday activities related to their discipline. This view resonates with Tropf's (2015) contention that critical thinkers working in academia need to understand that it is time to rethink higher education and to focus on research that is applicable to the future of work.

4.8.5 Thought leaders as capable of staying abreast with emerging technology

One of the key issues emerging from findings concerns the development of new learning opportunities and the need for innovative use of ICT skills. As new technologies constantly emerge, new knowledge and skills are required to scale ideas in educational spaces. This is consistent with the ideas expressed by Baines, Norgaard, and Rossing (2019), which implies that thought leaders are the essential change agents that drive the expert required in many of the future educational institutions. Therefore, thought leaders need to stay abreast of new developments and adapt solutions to address complex issues within their own environments. In pursuit of this view, it fits well in the broad themes of development of new learning opportunities and staying abreast with the innovative use of ICT skills.

Drawing on the ideas of Hee and Ying (2019), as thought leaders, postgraduate students in ICT in Education need to have the right combination of technological skills and necessary expertise as well as the ability to bring change to existing practices.

It is clear that postgraduate students as emergent thought leaders have a significant contribution to make in the field of education as they study their own practice and engage in further research within their own space. They should be encouraged to accept their role within their respective disciplines as being co-responsible to reshape the education system into an adaptable, flexible, and relevant learning environment. This is to ensure that leaners and students have the necessary competencies to pursue lifelong learning and acquire the necessary skills and competencies to survive and contribute to a rapidly changing society across the different industrial revolutions (Marwala, 2019).

The issue of digital transformation and the question of how to prepare the current generation for the fourth and future industrial revolution have been pressing issues for contemporary higher education, not only in South Africa but across the different nations of Africa and Latin America (Hee & King, 2019). It is clear from this study that such ideas call on higher educational institutions to refocus on evolving curriculum for authentic learning, continuous academic professional development, and balanced integration of technology into the curricula. Furthermore, calling on higher education students to accept

their role as emerging thought leaders in order to respond to challenges of the next industrial revolution.

Reasoning from the view that the future ICT education system tends to emphasize innovation, digital technology, science and mathematics, emerging technologies and industry, and the types of skills needed to succeed in a fast-changing world, postgraduate students as thought leaders must be involved in coaching and mentoring activities. With the advent of the Fourth Industrial Revolution (4IR) and the call for real mentorship and coaching, as Marwala (2019) notes, computer studies and ICT skills in education are needed in developing individuals to think technologically, creatively, and innovatively in order to adapt to the future industrial revolution challenges. With proper mentorship and coaching opportunities many postgraduate students will find themselves where they want to be in their future professions, a situation that was not so in their previous technological school and career times (Marwala, 2019).

4.9 Chapter summary

The chapter presented various codes and themes derived from the analysis of journal reflections. Codes were clustered in themes and presented accordingly making use of the actual voices of students to give meaning to the assigned codes. These themes were: introspection of own learning, engagement in learning, intellectual independence, development of new learning opportunities, innovative use of ICT skills and a high level of theoretical rigour. The chapter concluded with a presentation of a model to illustrate the emergent themes that speak to the metacognitive development of postgraduate students as thought leaders in an online education module.

CHAPTER 5. SUMMARY OF MAJOR FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter summarises the case study's major findings, conclusions, and recommendations as well as the strengths and limitations of the study presented. Recommendations for future research are also provided for consideration.

5.2 Main findings

Major findings are presented in accordance with the research questions and the themes as they emerged in the data analysis section detailed in the previous chapter.

5.2.1 Contribution of journal reflections to the development of metacognition in the post graduate students

Among the key findings in response to the research question, which sought to show how journal reflections contribute to the metacognitive development of postgraduate students as thought leaders in an online education module, the following were apparent: the participants' journal reflections play an important role in enhancing the development of their metacognitive skills. In many of the journal reflections, the participants indicated that such a reflection emerged from their report of the social interactions they enjoyed through guided learning with fellow post-graduate students. It became evident to the researcher that such a learning pedagogy enabled them to develop their thinking capacities and skills as thought leaders in their everyday experiences.

5.2.2 The role played by journal reflections in online education programmes

In dealing with the question of the role journal reflections play in the metacognitive development of post graduate students as thought leaders in an online education programme, The chief finding that emerged is that the journals play a crucial part in enhancing the process of self-evaluation, which is an introspection of own learning activities, progress, and experiences of the postgraduate students. Chief among this was the realisation that in the process they had an opportunity for integrating technology into their own teaching and learning processes. They gained some deep insights from the

levels of technological flexibility evidenced by their involvement in collaborative learning activities in the online computer programmes they were engaged in.

5.2.3 Functions of journal reflections towards the development of metacognition

The findings under the aforementioned research show that the online programmes helped the post-graduate students to foster their metacognitive skills, a high level of confidence in academic writing conventions, as well as the opportunity to realise the importance of the recognition of their prior learning experiences, which some may have been underestimating over the years.

Drawing from the theoretical framework adopted for the study, it is clear that the journal reflections showed that the online learning programmes helped scaffold the post-graduate students to develop their lower order online learning skills to higher order ones. This finding was consistent with the theme of the postgraduate students' development of a high level of theoretical rigour as can be noticed in Chapter 4 where all the details of the themes that emerged from the data analysis are highlighted.

5.2.4 The usefulness of journal reflections in developing metacognition in post-graduate students as thought leaders

The notion of positive transfer of learning, which social psychologists claim occurs when a new learner realises the benefits of learning in one area and adopts them to new problem-solving situations, was evident across a variety of the emerging themes. For example, under themes such as postgraduate students developing new learning opportunities, intellectual independence, innovation in ICT education, as well as in engagement in learning through collaboration. To show the development of the postgraduate students' level of innovation in ICT education and their intellectual ability to think independently, some of the participants reported that they were able to marry the content learnt theoretically in these modules and apply their new knowledge within their own working spaces to renew and redesign existing practices thereby challenging the assumptions of best practice.

It was pleasing to note that many of the assumptions of the socio-cultural approach to teaching and learning were examined and found worthwhile in this study. It was interesting to note how the concept of mediation, mediated learning experiences, and

scaffolding learning in students' zones of proximal development acted. It was also interesting how the concepts could be explored and ascertained in the study of online learning programmes and how they promoted the development of metacognition in postgraduate students as thought leaders.

5.3 Key conclusions of the study

From the abovementioned findings, the following conclusions reached.

Firstly, the journal reflections are an essential mechanism of promoting metacognition (thinking about thinking) and the development of new learning opportunities in postgraduate students as thought leaders.

Secondly, it confirmed the Vygotskian's theory of socio-cultural learning, which emphasises the role of learning tools (such as the use of technology in this research).Learning is a worthwhile perspective given the role the material and semiotic tools play in fostering metacognition in postgraduate students as thought leaders.

Lastly, the use of language, which is considered a psychological tool in the Vygotskian socio-cultural approach, also helps to improve the online-instructional processes by facilitating effective mediated learning experiences. Transforming postgraduate students' lower mental functions to higher mental, or psychological functions, requires prolonged discourse as captured in journal reflections and forms part of the mediator's efforts to scaffold students to attain intellectual independence.

5.3 Limitations of the study

This research study applied scientific rigour and as a case study is richly described allowing for some generalization to similar contexts (Altun, Kalayci, & Avci, 2011). Maree (2007) argues that elimination of the limitations in a case study and its interpretations is not based on the biases of the researcher but is based on rich descriptions of participants and their perceptions of their world. Because this study used an interpretive and subjective approach, the results do not guarantee reliability because researchers' expectations are likely to differ (Stratton, 1997). The interpretive analysis of journal reflections related to the two modules: *Educational reform: ICT practices & policy development A* and *Educational reform: ICT practices & policy development B.* Even though these modules were presented over a 14-week period, allowing for a long enough

period to give rise to metacognitive development, findings as presented in this research will need to be further investigated in subsequent online modules to determine the full transferability of findings.

5.4 Recommendations for the study

From the emerging themes and the findings reported in this chapter, the following recommendations are put forth to ensure an effective significance of true online learning collaboration. The following aspects as drawn from the analysed participants' journal reflections are essential.

Online learning programmes need to stimulate intellectual curiosity in postgraduate students and challenge them as emerging thought leaders. There is a need to emphasise and highlight the importance of activities that foster metacognition and to harness resultant awareness to direct and scaffold novice scholars as they take their place in academia and other related areas within the ICT domain in Education.

There is a need to explore the benefits of using other appropriate online tools similar to reflective journals as applied in this research to develop thought leadership qualities in novice and emergent scholars.

A further recommendation for research is to study the contribution of shared reflections within a community of practice, modelled within a safe space such as when working with peers. This will assist postgraduate students to design and test possible intervention strategies to enhance effective learning where they can enact their emergent thought leadership qualities.

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Appendices

Appendix A Ethics certificate

NHREC Registration Number REC-110613-036

UNIVERSITY OF JOHANNESBURG

ETHICS CLEARANCE

Dear Thembalihle Khumalo

Ethical Clearance Number: Sem 2-2019-050

Topic: Journal reflections' contribution to the metacognitive development of postgraduate students as thought leaders in an online master's programme

Ethical clearance for this study is granted subject to the following conditions:

- If there are major revisions to the research proposal based on recommendations from the Faculty Higher Degrees Committee, a new application for ethical clearance must be submitted.
- If the research question changes significantly so as to alter the nature of the study, it remains the duty of the student/researcher to submit a new application.
- It remains the student's/researcher's responsibility to ensure that all ethical forms and documents related to the research are kept in a safe and secure facility and are available on demand.
- Please quote the reference number above in all future communications and documents.

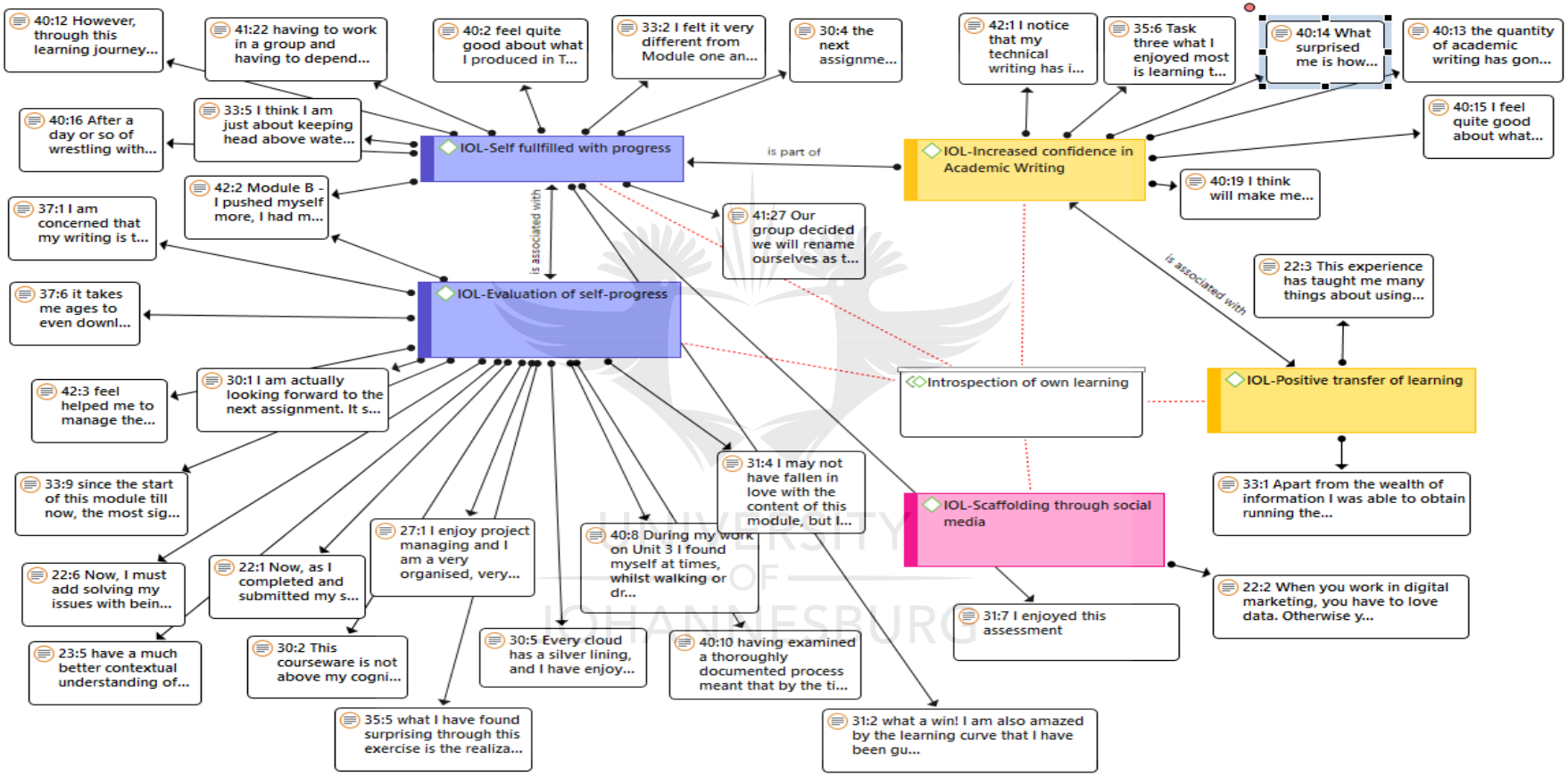
The Faculty of Education Research Ethics Committee has decided to

☒ Grant ethical clearance for the proposed research.
☐ Provisionally grant ethical clearance for the proposed research
☐ Recommend revision and resubmission of the ethical clearance documents

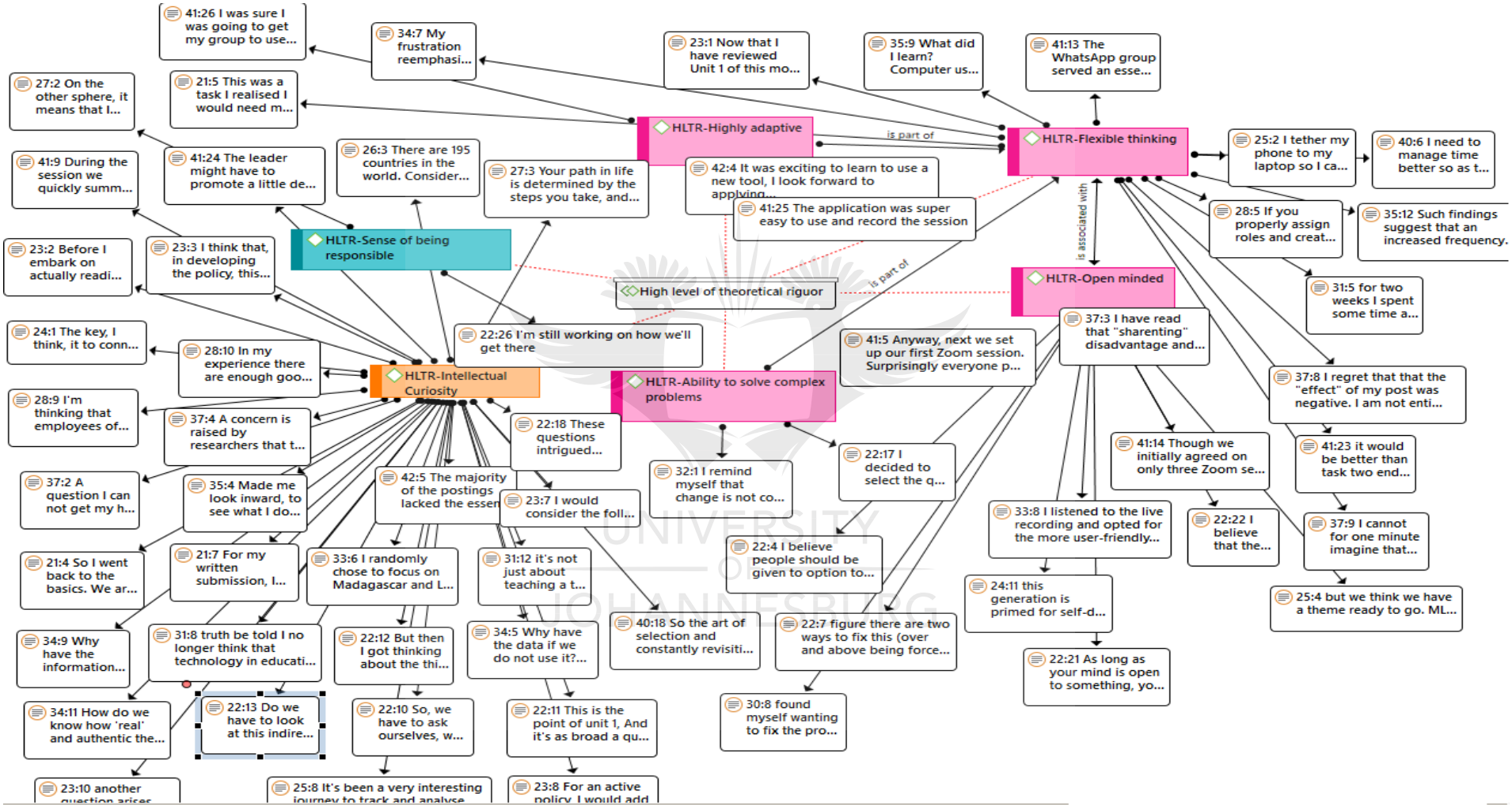
Sincerely,

Prof Mdu Ndlovu
Chair: FACULTY OF EDUCATION RESEARCH ETHICS COMMITTEE
19 November 2019

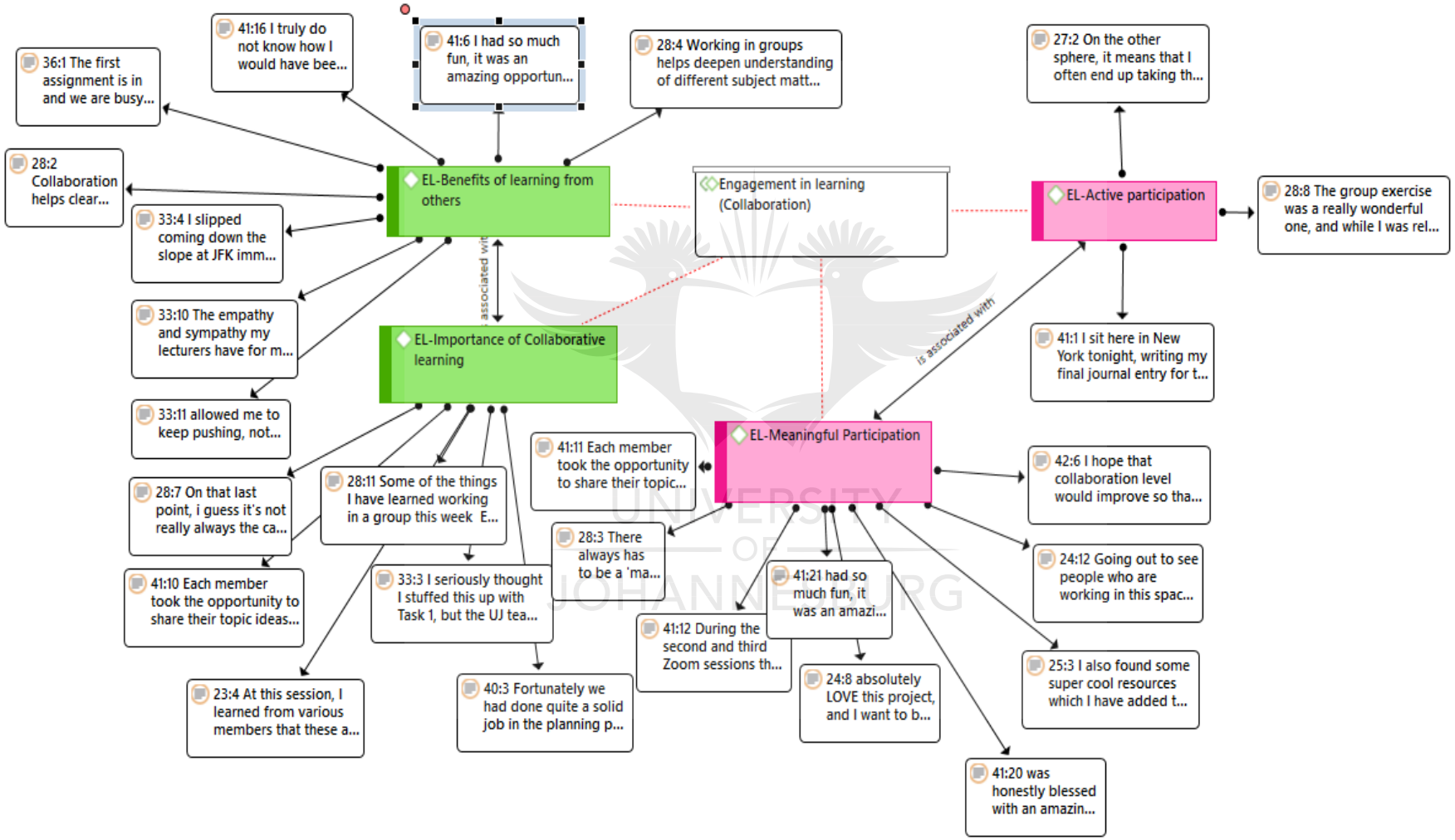
Appendix B: Quotations for Introspection of own learning



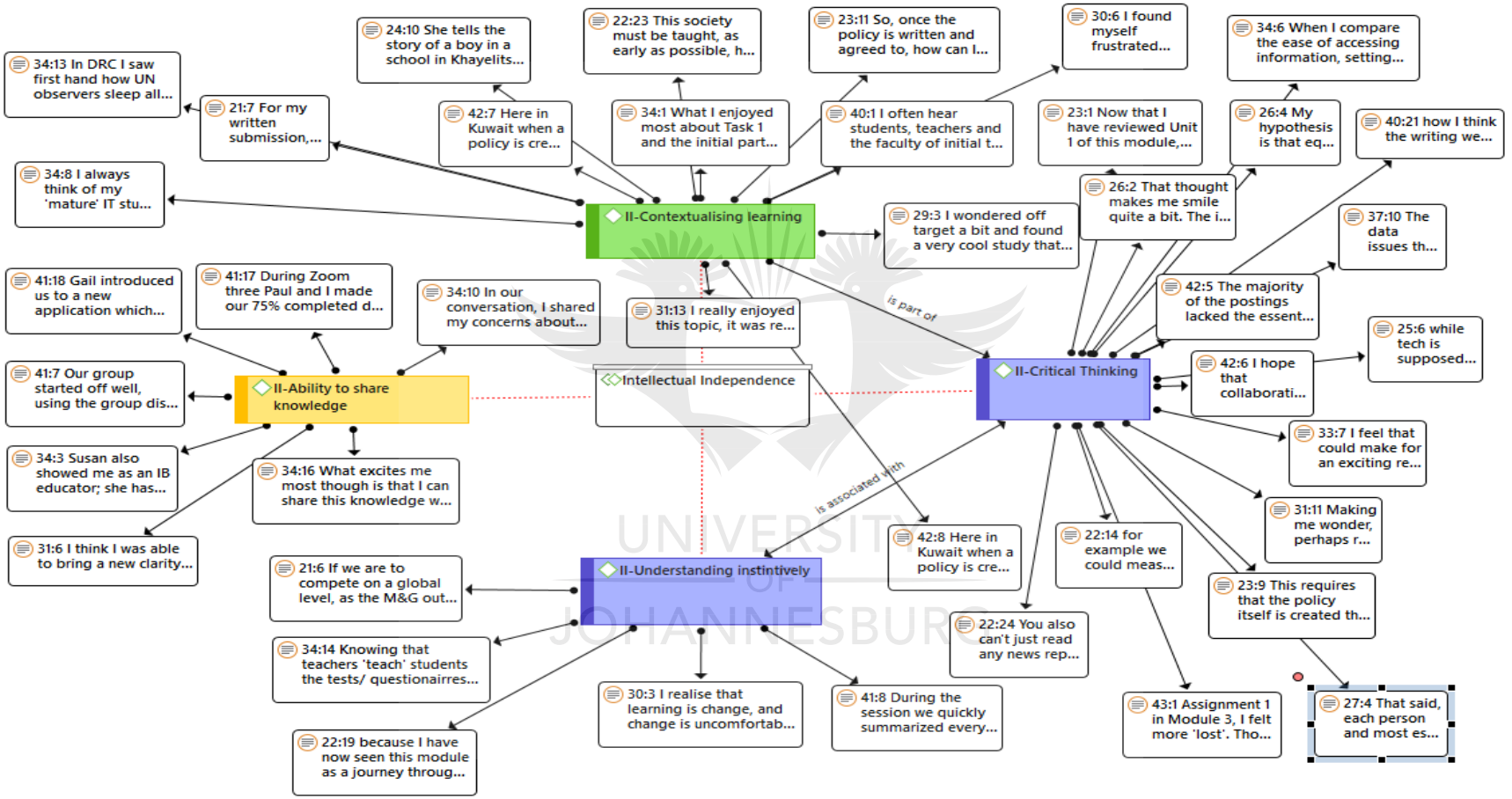
Appendix C: Quotations for High level of theoretical rigour



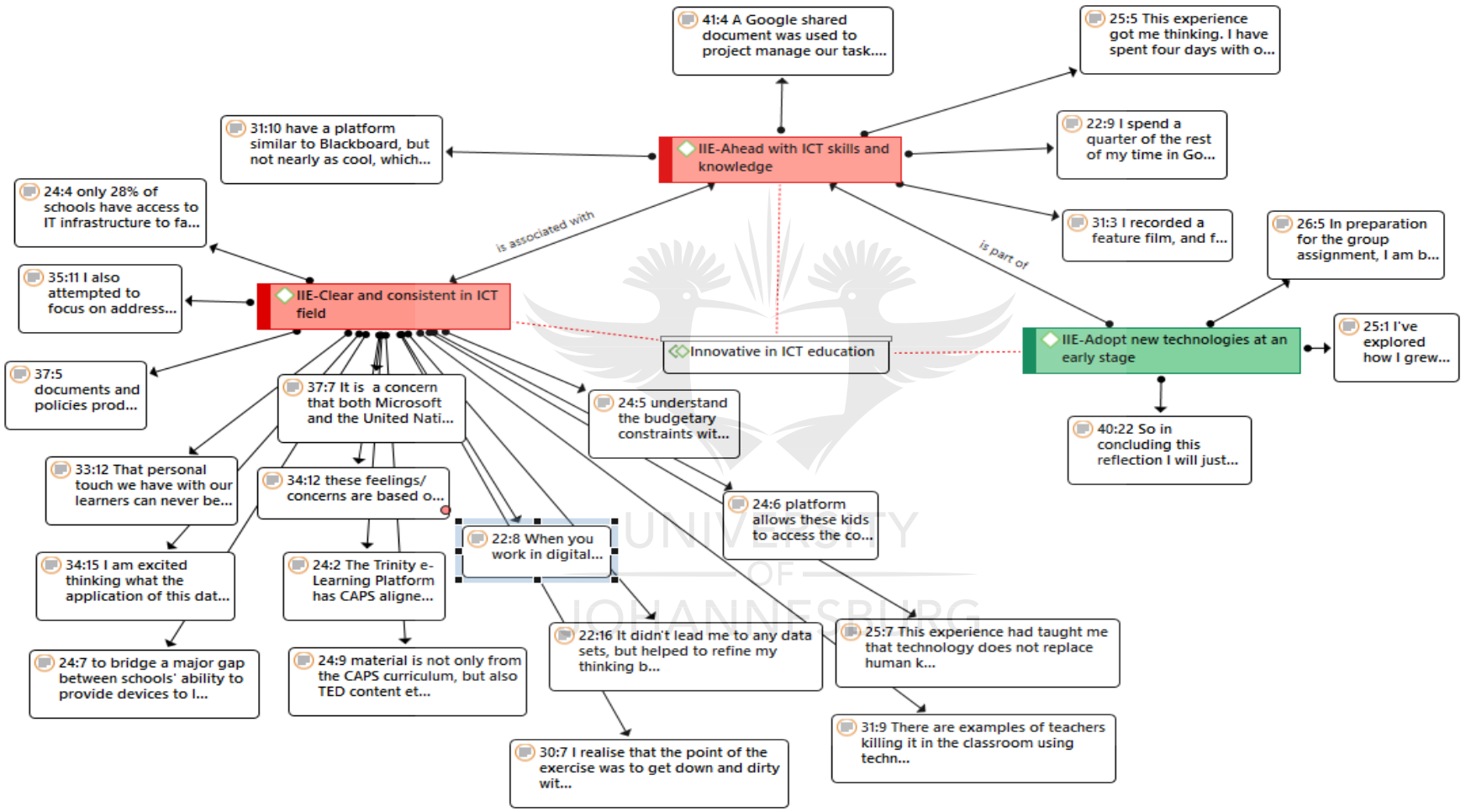
Appendix D Quotations for Engagement in learning



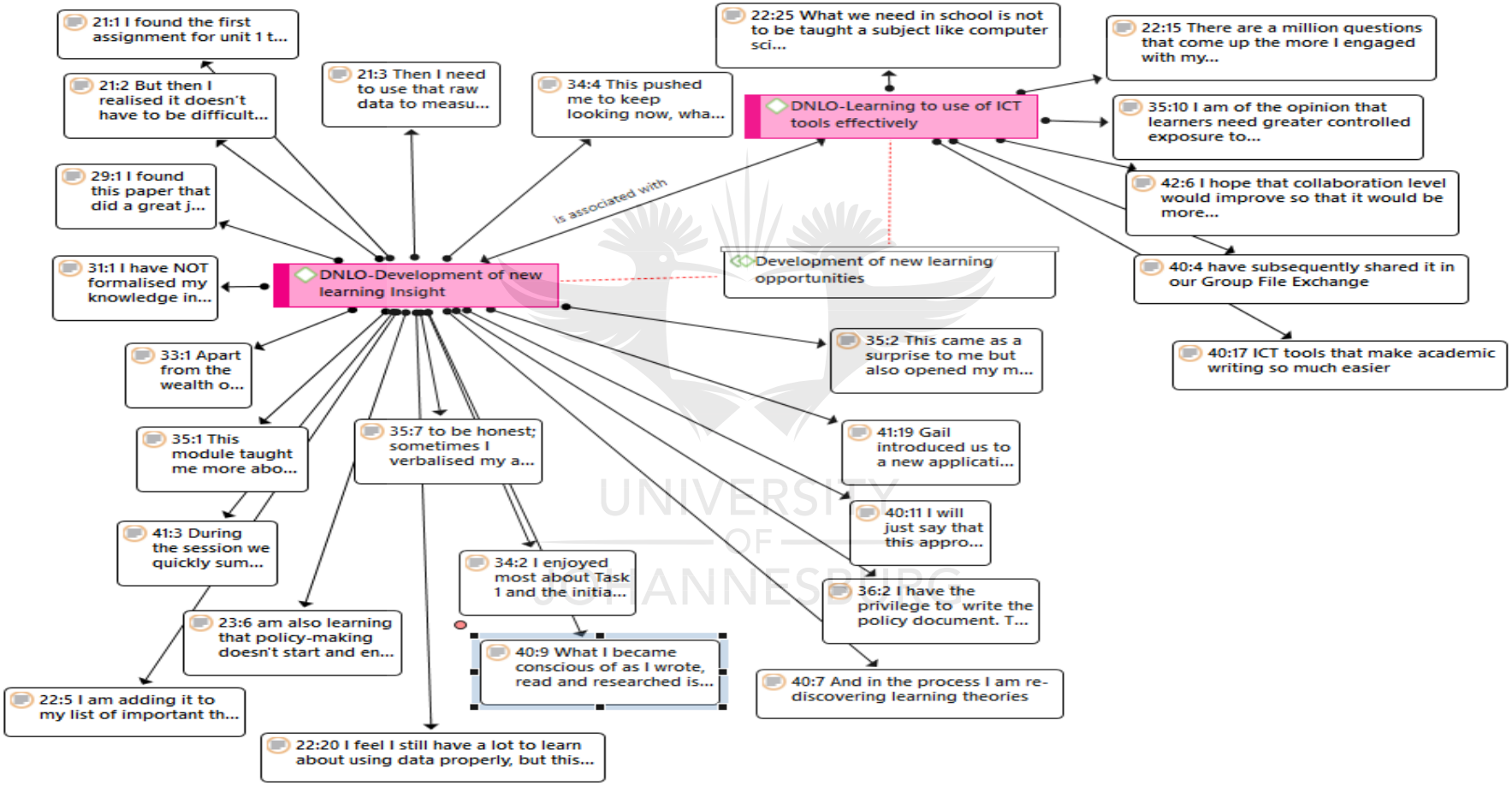
Appendix E: Quotations for Intellectual Independence



Appendix F: Quotations for Innovative in ICT Education



Appendix G: Quotations for Development of new learning opportunities



Appendix H: Journal instructions

The value of reflection during learning is articulated elsewhere in this module. Therefore, in this module, reflection is a mandatory learning activity that is assessed, and your performance in responding to the parameters for reflection as set out below, will contribute to the assessment marks for the module.

You need to make **four** journal entries of substance. You are to make a journal entry at the end of Weeks 2, 4, 6, and 7. This will allow you to capture your learning over three evenly spread periods, and allow for a summative, overall reflection at the end of the module.

Because this is an assessed learning activity, you **MUST** include (but is not limited to) the following in your journal entry:

1. Identify the **main topic/s** of your learning.
2. State how your existing knowledge was **expanded / amended / challenged /confirmed**, etc. The purpose here is to document your learning. For example, you may say:"This week I learned that policies do not just happen overnight but take years requiring input from multiple stakeholders ....". **Please note:** This section cannot be a mere summary of the content of the module. The following instructions may further guide you in narrating your learning.Be critical of your learning efforts. What did you do well, what could you improve on? Demonstrate that you have been thinking about your learning (metacognitive awareness). This means that you demonstrate awareness of what you know that you know, what you know what you don't know, and that you know what still needs to be done to finalise your learning.
3. State what you found relevant and meaningful, and why you found it to be so. Make connections between your past knowledge and experiences, and your new learning and personal knowledge.
4. What is the potential impact of your learning? This could be at a personal level, or at international, national or provincial levels, or at the institution where you are employed, for example at a school or college or a university.
5. How your learning affects your current view of education, and your understanding of education systems?

6. Could you identify gaps or limitations in the content that was presented that prevented your understanding of the topics?

a. If possible or appropriate, attempt to connect with previous journal entries, so that when read together, all the entries form a coherent whole.

7. Be sure to demonstrate that you have been engaging with the content. Again, it is not expected that you summarise the contents.
8. This is a continuous Assessment Task, and it expected that will run for the duration of the module. Enter a reflection at the end of weeks 2, 4, 6 and 7. Penalties will be applied should you delay journal entries, or should you wait until the end of the module to post entries.
9. Do consider the rubric that will be used to assess your reflective entries.
10. The module lecturer or teaching assistants **will** read your journal entry within days of your entry. When necessary, they will engage you. This engagement has as an aim to further deepen your learning in this module, clear up misconceptions that you may have, or perhaps just motivate you, wipe your tears or pat your back. In some cases, the staff member reading your reflection may ask you a question or questions for clarification. Should this happen, it is compulsory that you respond to that within one week.
11. Journal entries should not be short, frivolous, inconsequential, random, or personal observations or opinions about non-relevant issues. Please consider that staff need to open each entry in an index of entries, and workload is increased when several smaller entries have been made. Attempt to limit the entries to the journal to four entries of substance. "**Substance**" is a function of both word-length and content. An entry (or series of entries in the journal that reflects on more or less two weeks of work, cannot be considered substantial if the word-length is less than 300 words.
12. **Please do not attach files to journal entries. It complicates the reading of your entry, and at the end of your module, the marking of your journal entries. Enter your reflection in the text entry box only**.
13. The text entry box in the Journal tool contains a suite of tools, as indicated in the image below. You need to make use of these tools to improve the readability of your entries, for example by using bullet points, font formats, by inserting images, or when inserting references, making sure that links are active (always let linked pages open in a new tab). Should your text entry box not show the full tool bar suite as indicated by the image below, you may need to expand the tool bar (top right of the tool bar). Please keep in mind that when staff respond to journal entries, there are no editing tools available.